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CONTEXTUAL PROPERTIES AND STRUCTURAL VARIABLES: A COMPARATIVE ANALYSIS OF SCHOOLS OF BUSINESS ADMINISTRATION

by

BRYSON ROSS ARCHIBALD

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled "Contextual Properties and Structural Variables: A Comparative Analysis of Schools of Business Administration" submitted by Bryson Ross Archibald in partial fulfilment of the requirements for the degree of Master of Business Administration.

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ABSTRACT

A stratified sample of twenty-seven schools of business administration were selected for the purpose of analyzing contextual (i.e., age, subunit size, parent size, materials technology, professionalization, cultural and type of control) influences on selected structural (innovative growth specializations, internal support specializations and administrative control variables. The sample of twenty-seven schools of business consisted of nine United States private, nine United States state tax supported, and nine Canadian tax supported institutions.

The last objective of this thesis was to compare hypothesized contextual and structural relationships across, a) United States private and United States state business schools (i.e., controlling for differences in the type of control and b) United States tax supported and Canadian tax supported business schools (i.e., controlling for cultural differences). Another objective of the thesis was to compare within the samples, the relative strength of selected contextual (i.e., especially size and materials technological) variables as to their respective independent influences on various structural variables.

The findings revealed that United States private elite business schools have significantly larger number of innovative specializations, support specializations (non clerical) and proportions of administrative roles than state and Canadian elite schools. However, no attempt was made to generalize their findings to the larger populations of private and state business schools; that is, the findings are generalized to high quality business schools only.

One of the more significant findings was the fact that full

professors in United States private elite business schools foster the formation of specialized administration support specialisms such as admissions, placement and alumni functions. However, full professors in state elite business schools actually foster the development of these specialisms while no association was revealed in the Canadian sample. This finding for the state sample contravenes much of the literature on professionals and their orientations, to their professions.

In cultural comparisons, it was found that state ran supported elite business schools have larger numbers of administration support specialisms. However, it was found that in addition to cultural differences per se, within sample differences in age, raw materials (i.e., proportions of graduate students) and proportions of full professors also accounted for the mean differences of their support specialisms across cultures. However, when the proportion administration support was computed as a ratio controlling for size, Canadian business schools were revealed to have higher proportions of administrators (non clerical).

In terms of comparisons of the relative magnitude of various contextual variables within samples, the results revealed that submit and parent size were the best predictors of support and innovative specialisms within all three samples. The prediction power of materials technology was strong, but secondary to size considerations. The major conclusion of the thesis was that the type of external control (i.e., private versus state) and cultural influences (Canadian - United States) are major forces influencing the direction and scope of elite business school development.

It was concluded that these influences should be systematically included and controlled in future studies of university development.

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CHAPTER I

INTRODUCTION

The organizational structure of universities has been the subject of a great deal of theorizing. Some have posited that it is becoming bureaucratic (Anderson, 1963), some that it is collegial (Corson, 1960) or associational (Parsons and Platt, 1968), some view it as a federation (Clark, 1963), while another considers it a community (Millett, 1960). It has also been stated that no more useful ideologies presently exist, and that one, once must be developed (Olive, 1963) concomitant with the lack of useful ideologies is a reluctance of social scientists to study universities. Corson's (1968) stress that "the study of complex educational organization is a neglected topic," is congruent with Sidwell's (1968) contention that "the students of organizations have turned their attention to schools and the students of schools have been sensitive to their organizational attributes." Furthermore, it has been noted that universities have failed to develop effective administrative structures to cope with their increasing complexity (Litchfield, 1971).

Now, consider the Carnegie Commission has conducted a series of studies with one objective of isolating the various variables which affect the structure of universities. Some of these variables (constant and variable) include some of control, constitutional size, complexity and graduate emphasis. Although the objectives of their study were many, one prime area of concern was the isolation of variables that related to economies of scale in universities. They (Carnegie Commission,

1972:44) state that due to the complexity of multi-universities, studies should be carried out at the departmental level across various types of similar departments. Clearly, the multi-university is too large, with many diverse departments and schools, to draw accurate conclusions. For example, it stated:

> There is evidence, especially conducted at the University of Toronto, that economies of scale in individual programs are more clearcut than universities as a whole. This would be expected to be true, particularly in universities, comprehensive colleges and community colleges, where the influence of growing complexity as a factor offsetting economies of scale for the institutions, as suggested above, is important. (emphasis added)

In addition, the Carnegie Commission (1972) has also found significant differences in the contextual and structural properties of universities when controlling for the type of control of institutions (i.e., private and state) and also across different countries.[2] Gross (1968) and Bowen (1968) support their findings.

A study of organization structures at the departmental level, across similar departments, by type of control, and across countries may yield a more homogeneous approach to the study of complex universities.

Accordingly, this thesis has several objectives:

1. To compare the means of several contextual and structural variables across three sub-samples of schools of business administration. The three sub-sample stratification enabled us to control for differences between the United States private and state business schools, in addition to United States tax supported and Canadian schools.[3]

However, a comparison of the means of contextual and structural variables across private-state, and state-Canadian business schools gives limited information about the interaction of contextual and structural variables as they affect one another. As Burns (1967:137) denotes, "What counts is not the measurement of changes in structure and scale (important as they may be), but the identification and analysis of intervening variables which work out in sequential tree-like processes." (emphasis added)

However, there has been a great deal of controversy in organization theory concerning the relative importance of contextual variables (i.e., size, technology and structural variables (complexity, administrative component, and bureaucratic control). Hall (1972:139) suggests a promising approach to this dilemma in specifically including all hypothetically important contextual variables in a predictive model.

> When size (and growth) is taken in conjunction with technological and environmental factors, predictions regarding organization structures and processes can be made. (emphasis added)

Therefore, the secondary objectives of this thesis are:

2. To construct from theory a series of hypotheses relating contextual and structural variables. The hypotheses will be tested with data collected from sub-samples of Canadian, state and United States private business schools.
3. To compare across sub-samples the regression of coefficients of the postulated relationships.
4. To compare within each of the three sub-samples the relative weights of various contextual independent

variables viz. the dependent variable.

Path diagrams and the technique of path analysis will be used in the analysis of objective four of the thesis.[4]

FOOTNOTES

CHAPTER I

1. The Carnegie Commission has sponsored several studies over the past five years. The purposes of their studies have varied widely, but are mostly concerned with sociodemographic and financial profiles of American universities. Several of their studies are published under the author of the Carnegie Commission. The staff members of the Commission include: Clark Kerr, Chairman; Eric Ashby, Ralph M. Bisse, Joseph P. Cosand, William Friday, The Honourable Patricia Roberts Harris, David P. Henry, Theodore M. Hisburgh, C.S.C., Stanley J. Heywood, Carl Kaysen, Kenneth Keniston, Katherine E. McBridge, James A. Perkins, Clifton W. Phalen, Nathan M. Pusey, David Riesman, The Honourable William W. Scranton, Norton Simon, and Kenneth Tollett. Two Commission studies have been published annually. These reports provided recommendations for future growth and development of American higher education. These include:

a) The Carnegie Commission on Higher Education, New Students and New Places (New York: McGraw-Hill, 1971).

b) The Carnegie Commission on Higher Education, The More Effective Use of Resources (New York: McGraw-Hill, 1972).

The Carnegie Commission has sponsored other studies which have been written by some scholars not directly on the Commission staff: The Economics of Major Private Universities by William G. Bowen (Carnegie Commission on Higher Education, Berkeley, 1968), A Statistical Portrait of Higher Education, by Seymour E. Harris (McGraw-Hill, 1972), Resource Use in Higher Education: Trends in Output and Input, 1930-1967, by June O'Neill (Carnegie Commission on Higher Education, Berkeley, 1971), The New Depression in Higher Education: A Study of Financial Conditions at 41 Colleges and Universities, by Carl F. Cheit (McGraw-Hill, 1971), Models and Mavericks, by Morris T. Keeton (McGraw-Hill, 1971), Higher Education in Nine Countries, by B.B. Burn, P.G. Altbach, C. Kerr, J.A. Perkins (McGraw-Hill, 1971), The Invisible Colleges, by Alexander W. Astin and Calvin B.T. Lee (McGraw-Hill, 1971), Institutions in Transition, by Harold L. Hodgkinson (McGraw-Hill, 1971).

2. The distinction between contextual and structural variables has been made by Pugh et al. (1969:91):

It is not a model of organization in an environment, but a separation of variables of structure and organizational performance from other variables, commonly hypothesized to relate to them, which are called 'contextual' in the sense that they can be regarded as a setting within which structure is developed.

3. For this study, the contextual variables include age, size, parent size, technology, professional activity, and type of control. The two dimensions of organization structure used in this study have been used extensively. These include functional specialization and administrative ratio.

4. Path analysis has recently been used in organizational research studies. Aldrich (1972), Hilton (1972), and Blau (1970) have used the technique with cross sectional data. For an excellent discussion of path analysis, see Land (1969).

CHAPTER II

THEORETICAL BACKGROUND AND HYPOTHESES FOR CONTEXTUAL VARIABLES ACROSS SAMPLES[1]

Contextual variables refer to those variables which have been shown in previous research to be significant predictors of organization structure. The contextual variables in this study include age, institutional size, subunit size, technology, and type of control.

AGE

Age as a concept in organization theory, is usually defined as the age of the institution. Starbuck (1965:500-505), after surveying the literature, stressed its importance as a variable in determining the administrative component of structure, across all types of organizations. In short, he states that "The A/P ratio is probably an increasing function of time." More recently, Pugh et al. (1969) found the age of a sample of British manufacturing industries varied significantly with the "concentration of authority" component of internal organization structure. Older organizations tended to be associated with a centralized decision making structure. In the university context, age may prove to be a fruitful variable as many policies for promotion, tenure, and recruitment formulated in years gone by may still be utilized today. Clearly, until recently, change was not important for survival in most universities and this may have fostered the perpetuation of established policies. The concept will be operationally defined as a continuous variable as the date of inception of a business school at

a university.

SIZE

Size has been the most often mentioned variable in organization theory, and universities are no exception. A conceptual distinction must be made between the size of the business school and the size of the parent institution of the business schools. Pugh et al. (1969) and Child (1973) have made the conceptual distinction between subunit size (i.e., the department) and the size of the parent. Child (1973b: 336) reasons that the larger the size of the parent the greater will be the tendency to establish supportive roles at the subsidiary level. He maintains that demands for communication and/or "empire building" may be two factors which influence a disproportionate number of administrative functions. His data (1973:180, 1973b:340) support his hypotheses for complexity (functional specialization and role specialization) and relative proportion of administrative support. Parent size correlated positive (significant at the .95 level) with both measures of formal structure. Institutional size for this study was measured as the total number of full-time equivalent students.

The size of the subunit has been found in many studies to be related to all aspects of organization structure.[2] Moreover, there has been controversy over the relative importance of subunit size as a predictor of organization structure. Basically, three views have been stated. The Aston group, Boland (1969), Child (1973, Blau and

Schoenherr (1971) are some of the proponents maintaining that size is a critical variable in the determination of structure.[3]

The second view is expressed by Hall (1972:171) who maintains that subunit size is not as important a variable as complexity in predicting organization structure. Lastly, Woodward (1965), Harvey (1968), and Thompson (1967), argue that technology is a more important determinant than size. The conceptual approach taken for this paper followed the first view, that subunit size is a major predictor of organization structure in universities.

Following Parsons and Platt (1968), subunit size was measured as the total number of full-time equivalent faculty. Excluded were ranks below assistant professor, as many of these levels, including lecturers and teaching assistants, represent in many cases non-permanent staff.

TECHNOLOGY

Technology is a third major factor considered to have a major impact on the structure of organizations. A major question arises, however, as to defining and measuring the technology of a university. Aldrich (1972) has suggested that conventional measures of technology for manufacturing companies (i.e., workflow integration--the equipping and sequencing of operations in the workflow) are an inappropriate measure for technology for service types of organization. For example, at the business school level, how can the extent to which faculty are integrated be measured? A satisfactory solution is available when one examines the alternate ways in which the variable has been conceptualized.

Specifically, Perrow (1967:194-198) has defined one dimension of technology as the form of raw materials that are processed in the workflow of an organization's production. He maintains that organizations which process raw materials that are non-uniform will require men with more highly specialized skills. Hage and Aiken (1969) applied Perrow's ideas to people processing organizations and further reasoned that the more non-routine the materials technology the greater the number of diverse occupational specialties. In their sample of sixteen health and welfare agencies, they found routine technology correlated negatively (-.55 - .95 level) with professional training and number of occupational specialties (-.19 but not significant).

Clearly then, a viable conceptual approach to the technology in a university would be the "form" or type of student that the university attempts to graduate. For example, graduate students are a more varied form of workflow in that they require smaller classes, more personalized attention in terms of course selection, admissions and placement. Furthermore, their variability may also be relevant at the workflow level as the type of teaching and method of evaluation may vary considerably as compared to the undergraduate level. For example, research projects and field projects may supercede or coincide with formal examinations. Clearly, the greater proportion of masters and Ph.D's may have implications for increased specialization at the input-output administrative level (e.g., placement office, admissions-specialists). Thompson (1967) expressed this idea in terms of buffers to handle the variability. Parsons and Platt (1968) have operationally defined

research emphasis as including the proportion of graduate students to total enrollment. The composite score for this study will also be a relative one. Specifically, the operational measure will include the number of FTE undergraduates divided by the total FTE enrollment, multiplied by one, added to the number of FTE masters students, divided by the total FTE enrollment, multiplied by two, added to the number of FTE Ph.D's, divided by total FTE enrollment, multiplied by three.[4]

The Carnegie Commission (1972:35) has used a similar relative weighted index in order to ". . .reflect its (graduate FTE enrollment) higher costs. . . ." Clearly, these higher costs could partly account for various structural differences in business schools. In this regard, Barber (1968) notes:

> . . .to increase the amount of money from the government for research from two million to twenty million may cause a dramatic structural change in universities' research, teaching and administrative structures. (emphasis added)

Gross and Grambsch (1968:72) have found that graduate emphasis, measured as the percentage of graduate students to total enrollment, was a significant variable in making distinctions among the goal structures and organization structure of universities. However, other empirical studies using technology as a predictor of structure have not been as fruitful. Hickson et al. (1969), in a sample of 31 manufacturing industries, found no statistical significance between technology (measured as degree to which workflow is integrated) and various measures of structure. However, they suggest technology may affect structure in smaller organizations with homogeneous technologies. As will be shown later, schools of business administration are relatively small, most

with a faculty size of less than one hundred. In addition, all schools in this sample offered graduate education, thereby ensuring a homogeneous technology measure.

TYPE OF CONTROL (PRIVATE AND STATE CONTROL)

Many organization theorists (Thompson, 1967; Blau and Scott, 1962) have noted that type of ownership has an important influence on budget allocations, policy and performance standards. Empirically, Gross (1968) has found that the type of control of a university (i.e., private or public) is a significant variable associated with differences in goal priorities of private and public universities. He notes a "considerable part of the difference (between the goal structures of state and private universities) is precisely due to the stronger position of the state legislatures and government in their effect on the university." (emphasis added) His data reveal (i.e., a significant negative gamma at the .05 level) that state governments and legislatures value negatively the goal of encouraging graduate work at universities. In contrast, his data reveal (i.e., a significant positive .05 gamma) that state governments and legislatures value positively the goal of emphasizing undergraduate instruction. Moreover, the Carnegie Commission (1972:72) has noted that several states have recently enacted legislation affecting minimum teaching loads for professors in state universities. Hartnett (1971) has found that there is a significantly stronger tendency for trustees in selective public universities who "agree that running a college is basically like running a business," as compared to private universities. He concludes that:

> . . . the most basic reason for public and private difference comes from the sources of financial support. Because they do not have to answer to public constituency, trustees of private institutions may be more willing to maintain a looser hold on the reins. Though accountable to the alumni, parents, and 'friends' of the institution, such groups are basically for the institution and are seldom concerned about its actions as the general public might be of colleges supported by tax money.

Baldridge (1971:515) examined the type of control in terms of the various types of pressures that can be exerted on a university. He states that when the external resources contributed are concentrated, as in the case of state universities, this makes the university more dependent on the state. He contrasts this with the private university where the resources are more widely dispersed in small gifts, individual tuitions, and endowments. Accordingly, he concludes that the private universities may have more autonomy. Baldridge (1971:526-7) concludes:

> If the thesis is correct, we would expect that much of the <u>variation in the internal operation and structure</u> of colleges and universities can be predicted from a knowledge of their relation to their outside environment. . . . Of course, not all of the variations between schools can be explained by the environmental pressure variable, but it seems to have <u>real explanatory power</u> in unravelling the configurations of professional autonomy that we find in colleges and universities. (emphasis added)

Hawley <u>et al</u>. (1965) also support this view and conclude that "functions of all kinds tend to be shaped and adapted to a standard institutional structure." Empirically, Hodgkinson (1971:69) found that for the period of 1958-68, there was almost twice the number of state university presidents (as compared to private) who reported an increase in state departments' influence in policy making at the university. He (1971:122) also found this tendency for a sample of eight private institutions which became publicly controlled.

For this thesis, the variable type of control was measured in two ways. First, as a control variable for comparison purposes across private and state samples. Specifically, contextual and structural variables were analyzed within samples of private and state controlled business schools. Meyerbrand (1973:159) found that stratifying his sample of 7,000 hospitals into subsamples was effective in "distinguishing between three main types of hospital ownership and control." Secondly, type of control was measured as an independent variable using a dichotomous (nominal) scale. A zero was assigned for state controlled business schools and a one for private controlled business departments. This permits an analysis of covariance whereby the sole affects of type of control can be measured. This will be discussed more fully in Chapter V.

How may the variable type of control (i.e., differences across private and state samples) affect differences in contextual variables (i.e., size of subunit, size of parent, technology)? Various studies have provided insight into these differences. Gross (1968:49) found a significant .599 gamma relationship between the goal of stressing undergraduate education in a sample of 42 state universities, as compared to a sample of 26 private universities. Moreover, the goal was not an expressed preferred or idealistic goal, but a goal that was actually perceived to exist. The Carnegie Commission (1971:68) supports Gross' findings and has shown almost twice the full-time equivalent enrollment in a sample of 101 state, as compared to 63 private doctoral-granting institutions. Accordingly, hypotheses numbers one and two can be stated as:

The parent institutional size of state public business schools will be significantly larger than American private schools.

The faculty size research size of state business schools will be significantly larger than American private business schools.

Gross (1968:68) also found a significant .602 gamma denoting the significant difference between the goal of encouraging graduate work at private universities as compared to public universities. Again, these were not preferred responses, but responses of perceived goals as they actually exist. Again, the Carnegie Commission (1972:168) supports Gross as it found almost twice the mean number of graduate students as a percentage of total enrollment in private, as compared to public research and doctoral-granting universities. Projecting this finding to business schools, hypothesis number three can be stated:

3. The materials technology (i.e., relative number of graduate students) will be significantly larger in private schools than in state supported schools.

CULTURAL SYSTEMS (STATE AND CANADIAN)

Heydebrand (1973:58) stresses the importance of cross-cultural organizational analysis. He notes that ". . .such an analysis would focus on the systematic properties of cultures, by using organizations as the primary manifestations of institutional structure." Clark (1968), Parsons and Platt (1968) and Ben David (1968) have suggested that there are significant differences across cultures in university development,

control and structures. The Carnegie Commission (1971:37) shows that the relevant age group entering higher education as a percentage of the total age group in Canada (24 per cent) lies approximately in the middle of Britain (12 per cent) and the United States (35 per cent). Moreover, it has been argued that Canadian universities have tended to adopt aspects of both the British "elitism" model, and the United States' "open door" model of higher education. Therefore their findings suggest that culture ideals and educational policies account for differences in the institutional size of universities. Expanding on these findings, it can be reasoned that there will be significant differences between the size of United States and Canadian tax supported business schools. It should be stressed that there is a difference between comparing state and Canadian samples and United States private and state samples. The former reflects differences due to culture as both samples are public supported. The later comparison reflects differences due to type of control, specifically private versus state control. Accordingly, the variable type of control will also be measured two ways in the state-Canadian samples. Specifically, comparisons on contextual and structural variables will be made between Canadian and United States state subsamples. In addition, the cultural differences will be measured as a dichotomous variable (nominal scale), a zero assigned to Canadian schools and a one to United States state schools. This permits analysis of covariance which will be explained more fully in Chapter V. In studies in other cultures, Crozier (1964) and Richardson (1959) have shown that differences in cultures per se have accounted for variations

in organization structure. Therefore, hypotheses numbers four and five will be stated as:

4. The parent instituional size of state public business schools will be significantly larger than Canadian business schools.

5. The faculty size of state business schools (subunit size) will be significantly larger than Canadian business schools.

FOOTNOTES

CHAPTER II

1. See footnotes numbers two and three of Chapter I.

2. Hall (1972:109-139) gives an excellent summary of the literature concerning organization size and its relationship to all attributes of structure.

3. The Aston Group are a group of researchers from the Industrial Administrative Research Unit of the University of Aston in Birmingham. They have published a series of five articles from 1963 to 1969 in the Administrative Science Quarterly. Some of their articles will be referred to in this thesis.

4. A summary and additional explanation of conceptual and operational measures will be shown in Figure 15.

CHAPTER III

CONCEPTUAL FRAMEWORK AND HYPOTHESES FOR CONTEXTUAL AND STRUCTURAL VARIABLES WITHIN SAMPLES AND ACROSS SAMPLES

PROFESSIONALIZATION

Weber (1947) originally stressed the concept of professionalization in organization theory as "thorough and expert training." More recently, the concept has been conceptualized and measured by various perspectives. Therefore, studies utilizing the concept of professionalization must be carefully examined. Stinchcombe (1959) looked at professionalization at the occupational level and noted that professional occupations tended to use non bureaucratic forms of control (e.g., functional interdependence, as generating horizontal communication, lack of formal external rules, committees, negotiations, interaction, power relations made non visible, "intrinsic" incentive systems). This led to the development of the professional occupation as an ideal type and, until recently, obscured the measurement of professionalization within various types of organizations. Stated another way, bureaucratic and professional organizations were viewed as two ends of a continuum. Within this framework (i.e., the professional organization model), subsequent research measured the affect of external influences or dependence as influencing professional autonomy. For example, Hall (1968) analyzed the degree to which an occupation was professionalized (i.e., using Vollmer and Mills'(1966)concept of professionalization) and related this to various measures of bureaucratization. Scott (1965)

measured the influence of external dependence on the relationship between professionalization and reaction to bureaucratic controls. It should be stressed that both studies employed the professional organization as an ideal type and, as such, professionalization was measured at the occupational (macro) rather than organizational level. Litwak (1961) introduced a combined model of bureaucracy and professionalization and reasoned that professionalization and bureaucratic processes were interdependent and therefore coexisted in various types of organizations. He termed this model the personnel bureaucracy. The importance of this model was that it provided an alternative to viewing organizations as having attributes of both professional or bureaucratic ideal types. This provided a framework for viewing the concept of professionalization as an attribute of various types of organizations. Moreover, organizations with high proportions of professionals were viewed as having different structural characteristics than those with fewer proportions. Wtihin this framework, then, the measurement of the degree of professionalization was considered a viable undertaking. More recently, Wilensky (1968) has also noted this trend, especially with the growth of "new" forms of "professionalisms" such as nurses, teachers, and engineers. Moreover, in making this distinction, he rejects the concept of "professionalization" used by Vollmer and Mills (1966) (i.e., the degree to which occupations approached the established practitioner model of the professional association). He reasoned that the independent professional (e.g., doctors and lawyers) and his affiliated professional association should not be used as the sole criterion to measure professionalization. He proposed that new professions such as

nursing, teaching and engineering are a different form of professional and as such treats them as an ideal type.

In developing a viable concept of professionalization, Heydebrand (1973) does an excellent job in synthesizing the above views. In agreeing with Wilensky (1968) on the new form of professionalization, he also rejects Vollmer and Mills' (1966) measure of professionalization (i.e., measuring an occupation as a profession by the degree to which it approached the characteristics of an ideal type of professional association). Heydebrand (1973) maintains that this "old" concept of professionalization, although still applicable today, does not take into account the recent increasing professionalization of the labor force. Using Etzioni's (1964:77-78) definition of a professional (i.e., "professionals, in turn, may be defined as workers who are formally trained to produce, preserve, communicate and apply specialized knowledge") he reasons that technological advancement has resulted in the creation of a new form of professionalization. Moreover, he notes that organizations with high proportions of these professionals performing the administrative and line work can be properly called professional organizations. However, he notes that these "new" professionals (e.g., nurses, engineers and teachers), while having "professional" status, are not the same type of independent "professional" as the professional practitioner. He (1973:24) further reasons that the nature of the occupation of the new professionals (i.e., increased rationalization of the knowledge base);"

> . . .may very well work within an organization or bureaucratic framework since their job specialization and their person specialization may tend to coincide. That coincidence is, of

> course, proverbial for Weber's legal-bureaucratic expert who is a specialist but rarely a professional practitioner.

Stated another way, the training of the new professional (person specialization) because of its specialized nature is more of an integral part of a larger work process (job specialization). This, he maintains, is more consistent with Weber's (1947) traditional definition of a professional (i.e., "as thorough and expert training"). Accordingly, Heydebrand reasons that "new" professionals are an integral part of the work force of many organizations. Moreover, he reasons that variations of this "new" structural component will exist across similar types of organizations. Therefore the isolation and measurement of the degree of professionalization as an attribute of the "skill" component dimension of organization structure is theoretically and empirically valid. However, he stresses that measures of professionalization should include separate measurements of the "new" and "old" types of professionals. The major implication of Heydebrand's two professional models is that they provide a two-factor theory to account conflict between "professionalization" and bureaucratic controls. The key to understanding the conflict is not that bureaucratic controls and professionals are inherently in conflict but rather the allocation of power to professionals in organizations. He (1973:311) notes:

> We are suggesting, then, that the bureaucratization of professionals does not necessarily imply conflict between the professional and bureaucratic elements in professional organizations. Fundamentally, the problem is one of the degree of autonomy granted professional workers to specify and define operationally the goals of the organizations as well as the nature of the task, to apply their specialized knowledge and to control the available resources. (emphasis added.)

In this context he notes that professional autonomy will be a function of external dependence, routineness of task, and size. Moreover, the greater the external dependence and routineness of the technology, the greater the "rationalization of the knowledge base" (i.e., goals, tasks and controls in the form of rules, procedures from top management). As a result, less professional autonomy and greater conflict with bureaucratic controls will ensue. Moreover, the degree of conflict will be intensified if a greater proportion of "old" professionals comprise the work force. He supports his theory with significant correlations between professionalization and proportions of administrators under conditions of external dependence (i.e., public, private)and routineness of technology.

Heydebrand's (1973) work has been stressed because it provides the important theoretical foundation for this study. Three of his major theoretical ideas will be applied to this study. Firstly, is Heydebrand's dichotomy between functional specialization, departmental specialization (measures of the division of labor) and "skill structure" (degree of professionalization). He notes that "skill structure" will be related to the division of labor and technology, but conceptually and empirically it is a separate variable. He (1973:23) notes:

> The availability and use of experts and professionals in organization is, therefore, of considerable consequence, not the least because the two dimensions of job specialization and person specialization may be seriously mismatched. . . . The importance of <u>technical expertise and competence</u> (or the proportion of technical experts) as an <u>organization variable</u> derives from the obvious fact that certain <u>complex work functions must be, or tend to be, performed</u> by persons with <u>special knowledge and skills</u>. (emphasis added)

It should be noted that this measure differs conceptually from Aiken and Hage (1968) who view degree of professional activity and the number of different occupations as part of a composite index of complexity (i.e., both measures as part of the same attribute or property).

The second major implication of Heydebrand's (1973) analysis is that he treats professionalization as an organizational structural attribute. Accordingly, he measures it as the proportion of professionals to the total work force. This differs from previous studies (Hall, 1968, Wilensky, 1968) which measure the degree to which occupations are professionalized (i.e., the degree to which occupations emulate professional associations). Heydebrand and Noell (1973:305) stress this difference:

> To repeat, 'professionalization' in this paper will not be taken to refer to the process of an occupation becoming like a profession, but to the degree to which the organization labor force consists of professionals. . . .

Heydebrand (1973) supports this conceptual distinction by empirically showing that professionalization (proportion of graduate professional nurses to total personnel) and complexity (division of labor measures of functional and departmental complexity) have opposite affects on relative proportions of administrative support under conditions of routine and non-routine technology.

Similarly, Heydebrand and Noell (1973:305), in a sample of 121 welfare agencies, found that the degree of professionalization varied with size and number of programs. In this regard the number of programs was considered as "causing" variations in the proportionate number of professionals, thereby constituting an important intervening

variable between dependence, size, task complexity and bureaucratization. Therefore, stressing professionalization as a separate variable, he notes:

> For this reason (i.e., the number of programs and size as 'causing' variations in professionalization) <u>it is useful to consider professionalization as a variable in its own right</u>, especially since the number of different programs is also used as a variable (i.e., complexity of task structure was controlled to ascertain the independent effect of professionalization). (emphasis added)

These findings are consistent with Hall's (1972:149) contention that; "This multi-faceted approach to complexity would suggest that the determinants of different structural arrangements must be approached empirically. . . ."

Other organizational theorists have recently used degree of professionalization as an organizational structural variable (Zald, 1969, Montagna, 1968) as distinct from complexity (as measured by the division of labor).

A third and most important application of Heydebrand's (1973) analysis concerns the measurement of professionalization as an organization structural variable in universities. Gross and Grambsch (1968:43), for example, in their samples of private and state universities, measure the number of doctorates awarded as an indicator of productivity. However, for this study this measure is theoretically inappropriate because it measures one form of university output in absolute numbers. As such, the concept is a measure of performance. Clearly, we want a measure of degree of professionalization of the structure. Moreover, the measure should be measured at the productive component level (i.e., in line with the definition of a professional

organization). For example, in hospitals Heydebrand (1973) classifies a nurse as a professional and a person with a masters degree in social work in welfare agencies. Applying Etzioni's (1964:77-78) definition (i.e., "workers who are formally trained to produce, preserve, communicate and apply specialized knowledge) of a professional to a university study might lead to a measure using the proportion of Ph.D's as a criterion for endorsement. However, business schools today have nearly all faculty with doctorates and, therefore, such a measure would have little disciminatory power. Therefore, rather than measuring the level of education, one might consider measuring the degree to which faculty have a professional value orientation, that is, a dedication and belief that they can contribute most effectively to society by collectively defining and operationalizing their goals, and taking responsibility for their action. To these ends society sanctions the professional ethic. This measure would also be inappropriate for two reasons; firstly, the measure would not measure professionalization as an organization structural variable; and secondly, most faculty aspire to these goals, therefore such a measure would probably not produce much variation. The above considerations may lead one to the conclusion that a university is totally a "professional organization" and therefore professionalization should be treated as a constant. Therefore, if degrees of professionalization exist in universities, how can the concept be measured? Montagna (1973:539) addressed this same question when he found that the largest personnel agencies and accounting firms were both highly professionalized (i.e., for his measure of professionalization he dichotomized highly professional organizations as

having a staff with at least fifty per cent of which had a degree with a specified major) and both types of organizations had correspondingly high scores on measures of centralization and administrative support. However, when he analyzed his data within the dichotomized category of "high" professionalization he noticed that the eight (of a sample of twelve) largest accounting firms had lower proportions of administrative support. This indicated that compared to medium "professionalized" firms, larger "professionalized" accounting firms had lower administrative ratios. He concluded that the degree of professionalization accounted for these differences. However, the problem was that the largest accounting firms were professionalized one hundred per cent. Therefore, within this upper level, the degree to which professionalization affected administrative support could not be determined. This left his conclusion about professionalization accounting for the difference in administrative ratios a theoretical deduction. He concluded,

> It is obvious that for highly professionalized organizations more sensitive measures must be developed. (emphasis added)

Heydebrand (1973) expands on Montagna's conclusion and reasons that the real difference possibly accounting for the difference between the accounting and personnel bureaucracy is the "kind" of professional With a professional as scored on the above criterion (i.e., with a degree), the difference between an accountant with a degree and a personnel officer with a degree (i.e., one in charge placing clients with available jobs) can be explained by the "rationalization of the knowledge base." Specifically, the accountant may face a client with a unique problem of which there may be no precedents. However, in job

placement there are only a certain number of job classifications. Therefore (Perrow, 1967) the latter professional may be faced with a task with relatively fewer exceptions. This type of knowledge base is what Heydebrand associates with the "new" professional. These latter tasks are more amenable to the application of existing knowledge to relatively more routine situations, and as a result job specialization, internal division of labor, formalization and centralized decision-making can ensue. The accounting task, on the other hand, may be associated more with the "old" type professional. That is, each client's (firm) problems may be unique. That is, the number of possible problems that an audit could reveal is greater than the number of people that may not fit a job classification (or when there is not a person available to fit a job requirement). Clearly, solving a problem exposed by an audit could take more of a broader knowledge base (Heydebrand), less analyzable search methods (Perrow, 1967), larger and more diverse amounts of information (Galbraith, 1972) and greater role variety (Tyler, 1973). The common denominator of all there is is that the task complexity of the accounting profession has a less rationalized knowledge base, and these professionals, therefore, could expect more personal control over goals, task accomplishment, procedures and controls thereby resulting in a decentralization of these functions. An important question, which will have major theoretical significance arises as to whether this same "old-new" professional dichotomy concept would discriminate between "professionals" within the same organization. In other words, even though the eight largest accounting firms were one hundred per cent professionalized (by the definition of a college

degree) is there reason to suspect that the "old-new" (rationalization of knowledge base) "kind" of professionalization would apply to senior, junior and non partners? It would appear so, especially with younger staff. Their training and initial assignments would definitely be more of a routine nature requiring less amounts of information and less discretion. At the other extreme, senior partners would have much more involvement in "exceptional" clients, clientele the firm would accept, goals of the firm, and control.

Therefore the "old" professional has necessarily more autonomy in goals, task specification, control over resources and control over his standards. It would have been interesting for Montagna to have developed a ratio to measure the proportions of senior partners within his "Big Eight" sample as a more sensitive "professionalization" measure based on the "old" kind of professional. In sum, Heydebrand (1973) reasons that measures of professionalization should reflect two forms of professionalization, especially when an organization is large, has diverse technologies, and high proportions of professionally trained employees.

Concerning the original question as to whether viable measure of professionalization can be applied to a university setting; the answer is yes. Specifically, we can distinguish between faculty on this "old-new" dimension of professionalization.

In a business school context it can be posited that full professors approach the "old" form of professionalization. Clearly full professors may be able to preserve the "rationalization of their knowledge base" for both teaching and research to a greater degree than

less senior faculty. Specifically, they will probably receive highest priority in courses to teach, may teach graduate courses at the highest theoretical level, may better be able to orientate a course to coincide with their research interests, and may have reduced course loads. They probably attract more grants and are, therefore, financially more autonomous. They can probably do research in selective areas with possibly research assistants, and most importantly, they probably have greater power in policy because of the deference that goes with their rank, and their experience and proven competence.

Junior professors, on the other hand, may have to teach lower level courses, of which knowledge content has been more rationalized. They may have heavier teaching loads and may be subject to increasing controls concerning textbooks, class sizes and course content (i.e., to ensure homogeneity across class sections). Greater numbers of students, less proportion of research students, "normal" course loads probably reduce their time (relative to full professors) for research (knowledge base less rationalized). Moreover, their chances for research grants are probably much less than for full professors thus reducing their economic scope for research. Lastly, informal power to conform to policies will be accentuated because of promotion, rank and tenure. In sum, junior faculty have relatively less control over their knowledge base in terms of courses taught, calibre of student, scope and nature of research and external contracts. If this assertion is correct then the measure of proportions of full professors would provide an adequate measure of Heydebrand's "old-new" dimension of professionalization based on "rationalization of knowledge base."

More recently, other authors have also looked at the "rationalization of knowledge base" issue as an important variable in comparative organization research. Tyler (1973:384) takes up the issue but not necessarily in the context of "professional organizations." He reasons that person specialization and task specialization (i.e., which are really degrees on Heydebrand's rationalization of knowledge base) are both "empirically, as well as conceptually independent." However, he maintains that studies that have employed only personal specialization measures (measured as average occupational training) have neglected properties related structural components such as "structural disposition of personnel." He reconciles the measure of both concepts with a combined concept of "role variety" which measures both "organization specialization" and "gradients of expertise." He bases his reasoning of "role variety" on the concept of "role interchangeability." That is, organizations would score high on role variety if they had many different organization specializations with roles requiring large amounts of information. Implied in this view is that the large amount of information is of a non-routine, non-rationalized nature. Accordingly, roles would be less susceptible to rationalization and centralized bureaucratic controls.

Galbraith (1972:57) has also taken a similar "information processing" model of organization design. He reasons that organizations with uncertain task structures will require types of "personalities" (Tyler - high role variety, Heydebrand - "old-generalist professional") who can perform non-rationalized tasks (i.e., tasks for which rationalized rules and procedures are not available). He maintains, therefore, that

much of the work related to the task cannot be preplanned (i.e., "rationalized," "non-interchangeable"). Such organizations, therefore, would have different structural forms (i.e., decentralization of decision-making, more professional autonomy). Galbraith, however, uses the variable "task uncertainty" as a measure of this "information processing" concept. It should be stressed that most recent empirical studies measure the role that is created by "task uncertainty."

The common thread linking the theories of Heydebrand (1973), Galbraith (1972) and Tyler (1973) is a conceptual model of organization structure that would account for both occupational and personal specialization: Heydebrand (1973) and Heydebrand and Noell (1973) in samples of professional organizations use occupational specialization and personal specialization (degree of professionalization). However, he reasons that in organizations with diverse "knowledge" technologies, more sensitive measures of professionalization should be developed. As previously noted, he suggested that a measure based on the "kind of professionalization" should be developed. His concept of the "old" form of professionalization if measured structurally (i.e., as a percentage of the total productive component) would be congruent with the content component of Tyler's role variety (i.e., such roles, because of the amount and type of knowledge processed would be less susceptible to rationalization and interchangeability). In addition, Heydebrand's measure of occupational specialization included simultaneously with professionalization (on bureaucratization) in the same multiple regression equation, allowed for each of their independent effects to be measured. This occupational specialization measure would be congruent with the

occupational specialization component of Tyler's role variety index. With both measures in the same equation avoids the pitfalls noted by Tyler (1973:389): "Simultaneous use of both types of index often produces rather equivocal explanations. . . ." However, it must be stressed here that the "equivocal" nature of findings are not due to the methodology (i.e., including professionalization as a variable) but rather the insensitivity of that particular measure of professionalization which did not distinguish between the "kind" of professional in terms of "rationalization of the knowledge base." Addressing this point, Heydebrand (1973:21) notes:

> A confusing and often outright misleading element in many studies of the relation between professionals and their organizations is the fact that all of these 'experts' tend to be combined under the term 'professional.' Examples of studies in which these distinctions between professional practitioner and technical expert are not made and which therefore lead to inconsistencies and 'surprises' are Blau, Heydebrand and Stauffer. . . . It should be clear from the preceding discussion that technical specialization and professionalization are used here as structural attributes of the organization as a whole, not as attributes of individuals, careers or occupations.

Using occupational specialization and professionalization as separate concepts would theoretically be more sensitive to structural changes, as both concepts may have opposite effects on structure. These would most certainly be obscured with one measure accounting for both effects. Specifically, Heydebrand found that in the contexts of both non-routine and routine technologies, professionalization and degree of complexity had opposite effects on bureaucratic controls. More will be said about this under the section of administrative component.

Quite clearly, then, the measure of full professors would

measure the degree of role variety or degree of "knowledge base rationalization." In addition, this measure would not only reflect "role variety" in terms of the nature of role per se, but also in terms of the power and respect it receives. Moreover, the fact that a full professor is a symbol of academic achievement further reinforces the use of full professors as a valid measure of "role variety" or "professional expert" (again, these two terms denoting "non-interchangeability" of the role or the "non-rationalization" of the role). In this regard, Tyler (1973:390) notes:

> An operative in a position that may be filled indefinitely in his absence by a utility man or someone on supply has limited power to bargain over the execution of his task. Variety is an indication, therefore, not only of structural conditions of the division of labor but of the symbolic rewards that may be presumed (Stimcombe, 1963) to attend them. (emphasis added)

Stated more simply, Tyler is saying that, in addition to structural conditions (e.g., decentralization of decision making, professional autonomy) which accompany the role, so also do certain "symbolic rewards" such as rank. Necessarily, then, the rank of full professor will be a valid indicator of "role variety."

At least one author has noted the influence of full professors in their power associated with policies related to standards. Harris, (1960:37) who has probably done more empirical work on universities than anyone, notes:

> When institutions reduce the percentage of full professors, they tend to deteriorate their standards. They depend more largely on younger members of the faculty. A table (he does not reproduce the table) shows the proportion of full and associate professors is roughly unchanged over twenty-eight years for the Ivy League. . .

Given an open systems perspective, the proportionate number of full professors and the degree to which they can assert their power on policy and structure will depend on several factors including age, nature of raw materials - materials technology (i.e., proportion of graduate students) (Perrow, 1967), parent size Boland (1971), and external control (private-state) (Baldridge, 1971). Each of these factors will be discussed separately. If these contextual factors were constant, then business schools with higher proportions of full professors would collectively have to a greater degree, more power to influence policy than schools with smaller proportions. Therefore, the proportionate number and influence that this "collective rank" can exert will intervene between type of control, size, technology and bureaucratization. Therefore a key question arises; how does the variable type of control "condition" the amount of power that full professors can use to influence policy and structure?

One possible explanation emerges when one examines Perrow's (1961) view. Briefly stated, groups within organizations that contribute most to the attainment of subunit goals will have the most influence. It is well recognized that with accelerating costs in universities, other than budgeted funds are necessary for innovation and growth (Chiet, 1971). Accordingly, it can be argued that professional activity is one vehicle to attract these funds and perpetuate quality. This implies that recruitment of competent research faculty is a crucial element for the attainment of a university's goals. In such universities one could expect the group most qualified to attract these people would have relatively more say in university policy. Furthermore, since

privately endowed universities are more dependent on diverse (external) funding, one could expect senior faculty to have relatively more say in policy, and that budget allocations may be allocated relatively more to research, community interface, and recruitment of proven faculty, as compared to public universities which may be more dependent on the state legislatures. In the latter case, the goal of emphasizing the student may receive greater priority (Gross: 1968). In short, senior professors in private universities may have more say in policy and because they have to answer less to state legislatures, boards of governors and/or central administrators. This may incline them to appropriate budget allocations in greater amounts to research, community interface, and competent faculty. Jacobs (1974:54) has recently noted:

> Most prestigious universities are organized around the values of senior professors. . . . In most prestige universities faculty committees have a major role in policy decision. No doubt such arrangements act to help a university recruit a first-rank faculty since such men will be more easily induced to go to an institution where they will have a major voice in policy. . . . While the acquisition of quality professors is not essential (i.e., schools with major emphasis in student teaching) sources of external capital are severely limited for these nonprofit organizations and in this case external capital is rather essential since few universities can come close to making ends meet without it. . . . Faculty influence upon general institutional concerns is minimal. . . . Organization values then, tend to be those of the funding organization.

The real issue really reduces to what affects environmental interdependence has upon the priority or stress of a particular goal. More significantly, universities have three major goals; training students, scholarly and research contribution, and community involvement. The relationship of a university with the sources of funding will necessarily influence relative budget allocations, vis a vis the three goals. (Jencks and Riesman, 1968)

Given our samples contain business schools that offer graduate education, we assume that they will necessarily value highly the recruitment of high calibre faculty. That is, modifying Jacobs's view, our view will be that the type of control will be a strong factor influencing the degree to which "prestige" values can be operationalized. Therefore, reconciling Jacob's view with Gross' (1968) conclusion that state university goals are influenced more by state legislatures (as compared to private universities) implies that boards of trustees and administrators may have to stress less the goal of encouraging graduate work. This means that budget priorities may take precedent over research and community interaction. This is reinforced by the Carnegie Commission's (1972:72) finding that faculty in some state universities are increasingly being influenced by central controls. For example, some universities have recently enacted legislation affecting minimum teaching loads for professors in state universities. The implications for differences in scores on professionalization can be stated by hypothesis six:

6. The mean proportion of full professors to total faculty (i.e., professionalization) will be greater in American private business schools than in state schools.

In the Canadian-state business school sample comparisons, it was previously noted that Canadian universities have adopted both the British "elitism" and the United States "open door" models. In addition, it is a Canadian historical fact that industrialization of the Canadian economy occurred much later than in the United States. Moreover, Canada's industrial structure has traditionally been much more dependent on government subsidies and support as compared to the United States.

Accordingly, the British cultural influence, government intervention in business and late Canadian industrialization, in my view, has not been conducive to the development of business education in Canada (in terms of development and budget allocation).

In short, the "protestant ethic" and value of business as an institution per se has been less prevalent in Canada than in the United States. Moreover, until very recently, Canadian business schools have received very little support from industry, government research or other funding sources. The implications for graduate emphasis (technology) and professionalization can be stated by hypothesis seven:

7. The mean proportion of graduate students to total enrollment (materials technology) will be greater in state as compared to Canadian business schools.
8. The mean proportion of full professors to total faculty (i.e., professionalization) will be greater in state business schools as compared to Canadian business schools.

Several hypotheses can also be derived with professionalization as a dependent variable. It can be reasoned that full professors are highly demanded and therefore are very expensive. Therefore larger and more complex universities will have relatively more disciplines competing for high quality faculty; therefore smaller proportions of budgets per discipline for expensive full professors. In addition, relatively fewer positions for full professors per discipline for promotion of existing faculty could curtail incentive and therefore professionalization. Therefore, projecting to business schools, Harris' (1960:37) conclusions concerning size and professionalization, hypothesis nine can be stated as:

9. The larger the parent size of the institution, the fewer the proportion of full professors of a business school across all three samples.

At the business school level, larger total enrollments (especially with accelerating business school enrollment due to the post-war baby boon and declining popularity of some arts and science disciplines) and expanded course offerings has created an increased need for faculty. Accordingly, larger business schools may have had to appropriate relatively greater portions of their budgets for needed faculty rather than research faculties or proven senior faculty. Therefore, hypothesis ten can be stated:

10. The larger the subunit size of the business school, the fewer the proportions of full professors across all three samples.

Given the negative direction of hypotheses nine and ten; are there any reasons to believe that the strength or slope of these relationships should vary across United States state-private samples, or United States state-Canadian sample comparisons? Specifically, United States private business schools with larger parent sizes may have proportionately fewer full professors when compared to state schools. This may be due to the fact that endowments and sources of funds given to the entire university may have to be appropriated over more diverse disciplines. However, recruiting budgets for state schools may be tied to a greater extent to a fixed amount per student ratio. Therefore, because of this fixed allocation, savings gained through scale may be reallocated for promotion or high calibre faculty. In addition, larger parent sizes

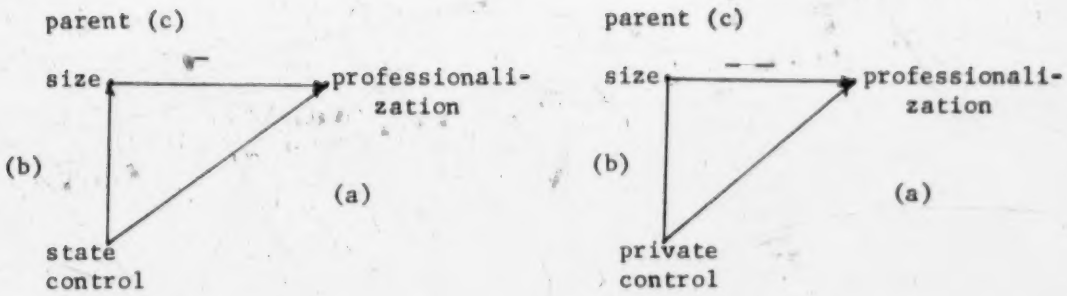
with commensurate complexity is most effectively controlled with decentralization of decision making. Clearly, large universities are too heterogeneous to maintain centralized decision making. Therefore, with larger parents sizes, state legislatures, board of governors or central administrators exert much less influence on the subunit goals. Boland (1971:429) from a sample of 115 state universities, supports this view:

> . . .with this in mind, it seems reasonable to argue that the demands of numbers "force" their institutions to make use of an organization model which is quite different from that used in smaller institutions. Where this model is found, furthermore, the faculty has considerable power to influence the institution's educational policy as well as matters of particular interest to each group of academic professionals through the faculty's governmental system and autonomous subject matter departments. Power over these internal or technical affairs is, therefore, decentralized. (emphasis added)

Moreover, he shows that as size increases, so does departmental autonomy on matters of promotions and merit increases, recommendations for new appointments and the termination of old appointments, and the determination of need of new personnel. In short, as compared to their private counterparts, United States state business schools with larger parent sizes may have their full professors decrease at a slower rate. Stated as a hypothesis:

11. The affect of hypothesis nine (i.e., slope or relationship between parent size and professionalization) will be more negative in state controlled institutions as compared to private institutions.

The schematic below shows in vector form hypothesis 11:



It should be stressed that type of control has two hypothesized relationships with professionalization: vector (a) denotes the direct positive effect (hypothesis 6) due to type of control; vector (b) shows that type of control conditions to a stronger degree a negative association between parent size and professionalization.

As previously mentioned, differences between Canadian and American culture will be important for Canadian-United States state business school comparisons. The Canadian university system has taken on many elements of the British system. The arts and science faculties have traditionally been the focus of Canadian university goals. Moreover, business schools, for reasons cited earlier, have not been accepted into the university system with the same ease as our American counterparts. Business disciplines in Canada have been looked upon as "technocratic" and "anti-intellectual." Again this is an outgrowth of the British elite model. Until recently, enrollments in Canadian business schools have been relatively small. For this reason as parent sizes of universities have increased, marginal increases in budget allocations may have been allocated to other disciplines. Therefore, hypothesis twelve can be stated as:

12. The effect of hypothesis nine (i.e., slope of relationship between parent size and professionalization) will be more negative in Canadian as compared to United States state business schools.

Because larger business schools tend to be older, age has been included in the model so that its effects can be independently controlled and predicted. As previously noted, the stable environment in which university institutions has evolved, has fostered the perpetuation of many policies. This, until very recently has contributed to promotional policies, of which length of service, has been a major criterion for promotion. Hypothesis thirteen may be stated as:

13. The older the business school the greater the professionalization across all three samples.

In terms of non-routine technology and professionalization, Heydebrand (1973:165) found that general, as compared to psychiatric, hospitals (i.e., the patients are much more non-routine for general hospitals) had higher scores on professionalization (i.e., proportion of professional nurses). In a university setting, Parsons and Platt (1968) also support this proposition. They note:

> . . .increased numbers of research students, increased concern for research on the part of a growing staff of teachers, a growing belief that evidence of academic achievement is to be found in scientific and scholarly publications have all led to the publication explosion. . . .

Since publishing is one criterion for promotion, then clearly business schools with higher proportions of full professors must reflect larger amounts of publishing as compared to schools with a lesser proportion of full professors.

In addition, business schools with proportionately larger amounts of full professors may also attract other full professors and more qualified graduate students. It is clear that many good research ideas are generated in conversation with other top scholars in the field. Moreover, much of the "leg" work is conducted by graduate students. Therefore, higher proportions of them would necessarily increase the research activity and probable publication rate and hence promotion. Hypothesis fourteen, therefore, can be stated as:

14. The greater the proportion of graduate students (i.e., more non-routine technology) the greater the proportionate number of full professors across all three samples.

Gross (1968) found that private universities stress more the goal of research and graduate education. In addition, Baldridge's assertion that private universities are more dependent on diverse funding related more to research and less subject to student workflow emphasis, may conclude one to expect that private business school graduate students may be utilized more for research per se. Put another way, controlling for absolute differences in proportions of graduate students one may expect that the full professors in private business schools may have more say in faculty workload, viz. research and teaching, and this could foster greater amounts of effort expended on research, publication and promotion. Therefore, hypothesis fifteen may be stated as:

15. The hypothesized positive relationship between graduate emphasis and proportion of full professors will be more pronounced in private than state business schools.

Moreover, due to the different cultural influences in the Canadian system, as previously developed (i.e., less stress of business in Canada, less competition in the Canadian system for funding, less stress on research and publication for promotion), one could reason that increasing proportions of Canadian business school graduates would be utilized to a lesser degree (i.e., although still positively) for research, and thereby be associated less with increasing proportions of full professors as compared to state universities. Therefore hypothesis sixteen can be stated as:

16. The hypothesized positive relationship between graduate emphasis and proportion of full professors will be more pronounced in state than in Canadian business schools.

Concerning the comparisons of the means of full professors for hypotheses six and eight, the argument can be made that the differences in the hypothesized proportionate number of full professors between the United States private and United States state and between United States state and Canadian business schools is not really a reflection of differences in the systems per se but rather due to the influence of the system on other variables that influence the proportion of full professors. For example, it could be reasoned that private business schools may be older, have smaller numbers of students and faculty, smaller parent size enrollments, larger proportions of graduate students, and these intervening variables "cause" the differences in proportionate numbers of full professors. However, there is still reason to believe that differences in funding, goals and locus of decision making in the state-private comparisons (and cultural differences in the state-

Canadian systems) will still account for different proportions of full professors even when the above variables are included (controlled) in a predictive equation with proportionate numbers of full professors as the dependent variable. Moreover, analysis of covariance with a nominal scale (0 for state, 1 for private, for state-private comparisons and a 0 for Canadian and 1 for state, for Canadian-state comparisons) included in the equation on proportion of full professors as dependent variable, will allow us to control the effect of systems differences independently with differences due to age, size, parent size and technology controlled. Therefore the true effect of system differences can be summarized by hypotheses seventeen and eighteen:

17. Private business schools will have a significantly greater proportion of full professors to faculty ratio than state schools, even when technology, parent size, subunit size and age are controlled (i.e., are included in the same equation).

18. State business schools will have a significantly greater proportion of full professors to faculty ratio than Canadian schools even when technology, parent size, subunit size and age are controlled.

The following schematic diagrams summarize hypotheses with the professionalization variable.

FIGURE 1: Hypothesis with professionalization for private-state sample comparisons.[1]

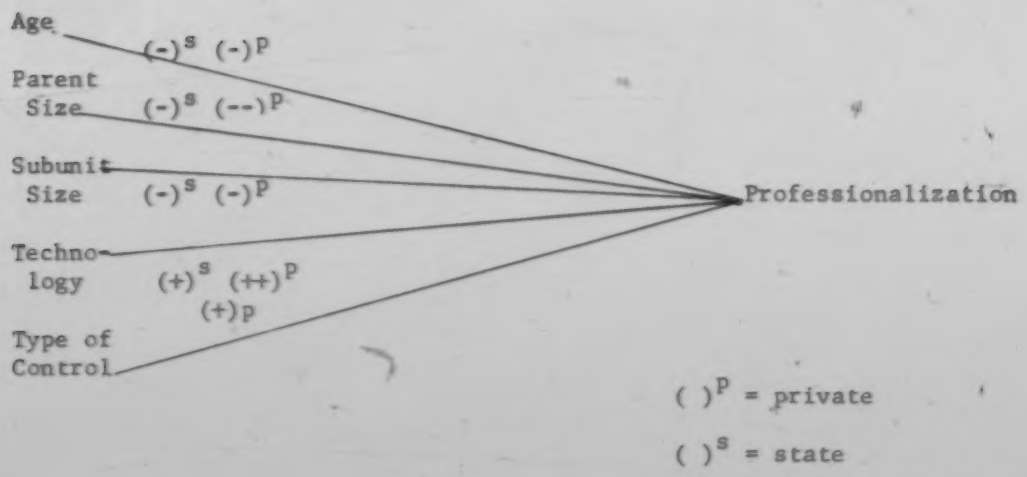
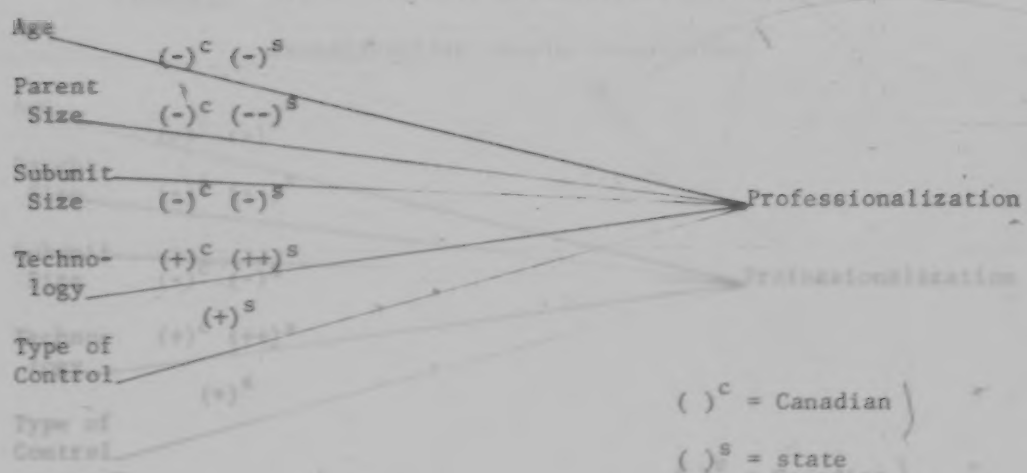


FIGURE 2: Hypothesis with professionalization for Canadian-state sample comparisons.[2]



INTERNAL DIFFERENTIATION

The second structural component relevant to the study of business schools is the concept of internal differentiation. However, subsequent to the literature review, it became obvious as to the numerous ways the internal structural component of organizations had been conceptualized and measured. It is little wonder that this led Hall (1972:141) to the conclusion that the concept of complexity is complex.[3] Before, a concept and definition could be established, the enigma had to be sorted out. Most of the confusion has evolved from the concept of complexity as denoting the internal structural complexity of organization. Basically two clusters of variables evolve from internal complexity. First, are those related to the complexity of the task structure. The task structure involves; a) the diversity of the product line, b) the geographical dispersion associated with various target markets of products, c) the form and variety of raw materials for product lines, d) the "operations" technology (i.e., how they are processed) and finally e) the nature of tasks that are required to process the raw material. The nature of the task complexity will depend on decisions relating to the product in terms of c) the form of raw materials, and d) the operation's technology. Both considerations will determine the variation of the task and how this variation will be manipulated (e.g., by machine, by knowledge, analyzable research methods, process approaches), and the frequency of this variation. For this study, these kinds of internal structural concepts were dealt with under the concept of technology.

The second cluster of variables associated with internal complexity will be those associated with the internal structural complexity. Once decisions regarding the product, the technology and raw materials are made, (usually classified under the "planning" concept of management) further decisions can be made with regards to "organizing." That is; a) how to allocate the work, b) allocate people to the work, and c) decide who should make the various decisions. Considerations for a) include the classical concepts of division of labor, including horizontal or functional differentiation and vertical differentiation. Examples of horizontal differentiation include types of departmentalization (e.g., by product, function or customer). Vertical differentiation will depend on decisions regarding span of control (tall versus flat) based on type of managers, nature of decisions, and where the decisions are made). Decisions related to b) will involve the type of "person specialization" and "task specialization." As Tyler (1973) has noted, various combinations of these exist; for example 1) project teams with high person specialization and high task specialization, 2) universities with high person specialization and low task specialization, 3) assembly line, low task specialization and low person specialization, and 4) hunting bands, high task and low person specialization.

The greatest amount of inconsistency of findings in organization theory has evolved out of the issue of person and task specialization ((1) and (2) above). Out of these, two "schools" have evolved. Hall's (1972) term, the "Blau-Meyer" formulation classifies the following view: as "differentiation" increases, the administrative overhead decreases. The other view is taken by Thompson (1967) and others who argue that

increases in "differentiation" increase administrative overheads. The key to distinguishing these two views is to analyze how they defined differentiation and then analyze why they defined it that way. The how aspect centers around 1) and 2) above; specifically whether the organization role was defined in terms of task or person specialization and more importantly, the why depends on the technology. Therefore, routine technologies foster role definitions in terms of high task specialization. Therefore greater numbers of like or similar tasks are easier to coordinate, hence, fewer administrators. If technology on the other hand is non-routine, then the organizing of these roles will probably be defined more in terms of the occupational specialization; that is, the role will be defined in terms of person specialization and this may result in higher administrative overhead due to the increased numbers of diverse personal specialized roles.

The real dilemma can best be illustrated when two similar organizations define their role specificity in terms of the physical operation of the workflow, but where there is some discretion as to the calibre of person specialization to fill that role. Therefore two types of similar organizations (by work process) may have a similar number of diverse roles, but one organization may have a higher proportion of "professionals" occupying those roles. Therefore the latter company would have a higher skill structure for the same number of specialisms. This distinction is very important for this study because the decisions regarding the number of occupational specialisms will be highly dependent on the workflow process. However, decisions regarding the level of expertise filling those roles will depend on other independent factors

such as resources, managerial philosophy, quality, standards and future goals. Therefore, to use measures of professionalization and diversity of occupational specialisms to indicate an organization's complexity will result in the neglection of some of the more important underlying forces affecting structure. Therefore, before defining a measure of internal differentation for this study, let us give an example of where the lack of distinction of the above factors has obscured some important factors.

In all their research Hage and Aiken consistently define an organization that is complex as having three aspects; degree of professional training, "degree to which members of an organization attempt to gain greater knowledge about their respective work activities and overall activities of their organization," and the "division of knowledge into separate occupations." As such, they measure all three variables as a package to represent complexity. However, some of their (1969:372-373) results have shown that the degree of association of their indicators have varied widely in their association with major variables such as routineness of technology. For example, they found that the more routine the work the less the need for experts (-.5 correlation). However, the routineness of work did not affect the number of diverse occupations (-.19). The conclusion of this is that routine technology has no association with the number of occupational specialisms but it does affect decisions as to the level of "person specialization" you staff those roles with. More important, these results show that the occupational diversity component of complexity does reflect to some degree large proportions of "non expertise" incumbents. That is, routine

technologies are highly associated with non-technical incumbents. Therefore organizations with routine technologies in the sample will have occupational roles filled to a large degree by non expertise incumbents. Therefore, the measure of the number of occupational diverse specialisms will lack the "person specialization" component. This is important because if one examines their theories in other literature (1970:17-85), they do imply that organizations adapt to the proliferation of knowledge by recruiting specialists (person specification) for organizational roles. The important point here is that it is the "specialist" component of these diverse specialist occupations that result in various organization styles. They (1970:18) note; "The creation of new occupations as a solution to the accumulation of knowledge and as a solution to the achievement of complicated objectives. . . ." The major point here is that if technology varies more intensly with professional training than with the number of occupational specialisms (i.e., the measure of occupational specialisms also reflects roles with non-expert incumbents) and if it is the expertise component of complexity that really "causes" innovation, then the use of occupational variety is not the best measure to use with innovation. However, when one examines their findings (1968) one will notice that the association with occupational variety and innovation was .75 while professional training correlated only .32 with innovations. It is little wonder why they concluded (1970:18); "It (occupational variety) is also the single best measure of the development of an organization. . . ." (emphasis added) It is important to note that they used zero order and partial correlations to make their conclusions. However, they never

did partial out the affect of professional training on their correlation of occupational diversity with innovations. Clearly, then, if it really is the expertise component of complexity that "causes" innovation, then partialling it out would probably significantly reduce the association between occupational diversity and innovation, thereby making much of the association spurious. The implications from this analysis are very important for this study. First, decisions viz. person specialization and occupational specialization (i.e., I have carefully not used task specialization because Aiken and Hage (1968) specify that their measure of occupational diversity excluded "task specialization where one activity might be divided into many specific and separate tasks") are partly based on independent processes, and as such should theoretically and empirically be considered separately. Heydebrand (1973) empirically verifies this observation. Secondly, both variables should, therefore, be included independently in any model in comparative organizations. In this regard, I agree with Mohr's (1971:455) assertion that in choosing indicators of "multi-faceted" concepts (he uses technology as an example), it is important to select a priori that component of the concept which may be relevant to the particular study. Therefore, in selecting a concept of internal differentiation for business schools, vertical differentiation measures are inappropriate. In terms of horizontal internal differentiation, by the preceding argument, professionalization (i.e., person specialization) was treated as a separate variable. Therefore, horizontal concepts of differentiation could be of three forms. More specifically, if the goals of a business school are to; a) conduct research and make scholarly contributions to

specialized fields, b) educate students, and c) contribute to the local community, then an analysis of differentiation in terms of these goals could yield important findings with respect to a school's research emphasis, effectiveness and emphasis in terms of students (e.g., admissions specialism), indications of community involvement (e.g., executive programs) and administrative overhead (this concept will be discussed in the last section of this chapter). However, horizontal differentiation, in organization theory has usually focused on what Heydebrand (1973:19) terms the "adaptation" model. Specifically, organization changes within already existing task structures. However, "innovation" (i.e., as defined by organization changes outside existing tasks) until recently has been a neglected topic. Moreover, recent studies have viewed innovation in terms of inter-organization relationships, thereby resulting in its measurement as the number of joint programs (Aiken and Hage: 1968). However, the addition of new specialisms (i.e., those specialisms created outside an organization's existing specialisms) even though of a different form, would certainly be an example of internal differentiation.

Clearly, if a conceptual basis can be found to distinguish the above forms of specialisms, then these concepts would certainly qualify as valid theoretical indicators of internal horizontal differentiation. This would avoid the pitfalls stressed by Pondy (1969) and Mohr (1971) concerning the ad hoc selection of variables (i.e., as indicators for multi-faceted concepts) and the subsequent search for empirical regularities. Therefore, the major question arises, how can one make the conceptual distinction between these "adaptive" and "innovation"

specialisms?

Clark (1968) offers a conceptual approach to help clarify the ambiguity. Focusing on growth patterns of universities, he distinguishes between "organic," "differentiated," and "diffusion" growth specialisms. He notes that in order to understand the nature of growth of universities, one must examine the way in which specialisms are added. He proposes "four models for analysing institutionalization of innovations." His organic growth, differentiation, and combined- process models will be particularly relevant to this study. Specifically, the process of internal differentiation refers to the addition of specialisms due to internal growth of existing specialisms. For example, an existing specialism such as student affairs may grow due to increasing enrollment; to the point where the existing specialisms will subdivide or internally differentiate into two separate specialisms such as student counselling and student placement. Other examples of these types of specialisms would include admissions, planning, and alumni (a content analysis was done on these specialisms to ensure that specialisms counted included homogeneity of content). It is important to note that as the process of internal differentiation occurs, the resulting specialisms become more specialized. Therefore, growth in this way would contribute to what Blau refers to as "intra unit homogeneity." This type of growth is more amenable to economies of scale, in that personnel from within the previous larger specialism could perform the more specialized activity. In addition, existing administrators could probably supervise this homogeneous expansion. For the sake of brevity, these types of specialisms will subsequently be referred to as "support" specialisms.

However, the division of labour in universities has followed other types of growth than mere growth of existing specialisms. Clark's (1968) combined-process model provides a more than adequate model for conceptualizing types of specialisms added to a university, not due to the growth of existing specialisms, but rather specialisms added due to other factors. For example, setting up a research bureau in response to a private gift or federal grant (i.e., due to a reason other than sheer growth of existing specialisms) would represent a different type of specialism than a student placement specialism evolving from a student affairs function (i.e., resulting from sheer internal growth). Moreover, the former types of specialisms would certainly be of a different nature than the latter. Examples of the specialisms derived by an application of the combined-process model would be Bureaus of Urban Research, Executive Programs, Programs of international studies, and government liaison. These types of specialisms would not be as conducive to economies of scale, as in many cases they require the direction of top qualified scientists which may have to be specifically recruited. For this reason it can be conjectured that this type of specialism would contribute to what Blau (1970) calls "inter-unit heterogeneity" with the effect of adding to administrative overhead. The effects on the administrative component will be discussed more fully later. Specialisms of this type will be referred to as "innovative" specialisms.

Accordingly, using a consistent application of Clark's (1968) models, we have devised two measures of internal differentiation. It is hoped that such a conceptual distinction could help justify a more homogenous set of specialisms and account for the dual effect that

internal differentiation has on administrative components (Blau, 1970).

Following Pugh et al. (1968), "the distribution of organizational tasks among positions as official duties" will be used as a criterion for measuring both forms of specialisms. In addition, to quality, as in Pugh et al. (1968), "the particular specialization is performed by one or more persons full-time." Finally, these specialisms were measured at the administrative level. Coordinating administrators were excluded (i.e., Deans and Assistant Deans). Moreover, since these variables represented a measure of the degree of differentiation of business schools and not for the entire university, only bureaus specifically under the auspices of the business school were included (i.e., joint programs were not measured).

In a comparative context, is there any reason to expect differences between the two types of specialisms across samples of private, state and Canadian universities? Some theoretical and empirical studies have focused on this question.

1. Innovative Specialisms (combined-process growth specialisms)

Clark (1968) reasons that the competition of the university environment for funds is a major factor contributing to differences in the degree of innovation between private and state universities. He notes:

> The traditional mechanism for governmental support in European institutions--found in American state universities is the fixed annual budget, disbursed largely through the university administration. . . . In contrast, the most frequent vehicle for funding by private foundations and the U.S. government is the contract or grant. Forcing incumbents of elevated university statuses to compete for funds instead of guaranteeing them an annual budget makes the entire system more competitive. A

> university (i.e., private) system financed largely through contracts and grants tends to be more competitive and also more innovative than one financed through fixed annual budgets. (emphasis added)

In structural terms, Barber (1968) reinforces this view:

> . . .to increase the amount of money from the government for research from two million to twenty may cause a dramatic structural change in universities' research, teaching, and administrative structures.

Therefore, reconciling these two views in terms of "open-systems" theory, we can postulate that the nature of the external system affecting a business school will affect the nature of the funding (i.e., creating an uncertain environment) thereby creating greater competition in the system with subsequent implications for the acquisition of funds. Therefore, the probability of such a system conducting more research and attracting larger proportions of funds (as compared to the state system) would be increased. In addition to the competition factor, Baldridge (1971:525) denotes that the lack of external resources in concentrated form from outside the university (i.e., tuitions, endowments, government contracts) helps to facilitate institutional autonomy by dispersing the external support. Therefore, he reasons that there is a greater tendency for private institutions to legitimize and specialize boundary roles. This would have effects on the relative success by which private business schools (as compared to state) could formally add and therefore legitimize a research bureau as an "official designated specialism" (i.e., subsequent to actual acquisition of the funds or grants). The factors, autonomy and competition in the entire system then, could account for greater number of officially designated innovative functional specialisms in all private university subunits.

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Empirically, the Carnegie Commission (1971:59) found that for organized research, (i.e., they make the distinction between organized research and instructional research) private university expenditures per FTE student were more than three times as great than for state universities. In this regard, the Commission (1972:73) notes:

> Thus, we cannot quarrel with the tendency of state legislatures in recent decades to regard financial support of research as predominantly a responsibility of the federal government and of private foundations. (emphasis added)

Hodgkinson (1971:107) however, disagrees with this view. In his study of eight institutions which recently moved from private to public control, only thirteen per cent (or one institution) reported an increase in federal support. He concludes, ". . .quite clearly, it is the state department of education which is the new source of policy and money." However, in regard to these non-differentiated functions gaining specialized status, the Carnegie Commission (1972:133) state:

> There is no question that the administrative structures of many universities of higher education, especially research universities, tended to become more complex during the 1960's. The rapidly increasing flow of research funds was an important factor in this development, resulting in the creation of new research institutes with their administrative staffs and in the expansion of the functions of general campus administrators concerned with the negotiation and processing of research contracts and grants. (emphasis added)

Therefore, hypothesis nineteen will follow the view stressed by the Carnegie Commission:

19. There will be a greater mean number of research bureaus and programs (i.e., specialisms "added on"--not due to expansion of existing specialisms) as measured by officially established specialisms in private business schools than in state business schools.

In Canada, it is well recognized that corporation and private gifts are much less common than in the United States. Hypothesis twenty will be stated as:

20. There will be a greater mean number of research bureaus and programs (i.e., specialisms added not due to internal growth differentiation) in state schools than in Canadian schools.

In terms of predicting this dimension of differentiation (i.e., specialisms added not due to the growth of existing specialisms), each of the previously mentioned contextual variables (i.e., size, technology, parent size, professional activity, and type of control) must be considered. Some researchers have focused on these variables.

Clark (1966) posits that newer institutions have no traditions to monitor innovations, and therefore their staffs will have greater tendencies to institutionalize new innovations. Hypothesis twenty-one, therefore, may be stated as:

21. The younger the school of business administration, the greater will be the number of bureaus or programs, and this relationship will be consistent across all three subsamples.

Clark (1966) denotes a series of stages in his organic growth model that precede the institutionalization of an organic growth specialism.[4] The first of these stages includes the development of professional activity. It will be recalled that this study measures the proportion of full professors as an indicator of professionalization. Clearly then, the greater the number of full professors in a

given department, the greater the probable volume of intra and inter-faculty communication within specialized areas. Clark (1968) reasons that the informal process of professional activity will continue until statuses and individuals associated with those statuses are positively identified and legitimized by society as a whole. Then attempts may be made to legitimize the new specialism. Given that full professors within departments are at the top of the professional status ladder, their activity, then, toward the institutionalization of a given specialism, may be expected to have more power than faculty of lower statuses.

A key question is, therefore, raised, <u>why</u> and <u>how</u> may social positions (*i.e.*, full professors) have the power to effect organization change and, equally important, what conditions of external control may hinder or foster the ability to exercise such control? The above two questions are probably the most important questions in contemporary social research, and are certainly two important questions in this study.

Crozier (1964) stressed the importance of power as the major determinant of organization behavior. However, many "structural" organization theorists assume the concept away or make grandiose macro statements that culture and/or institutional structures will <u>uniformly</u> cause decision-makers to structure in a certain way. Pondy (1969) reemphasized the issue in distinguishing between owner versus managerial controlled industrial concerns. He recognized that the former group would want to maintain power and, therefore, such groups would have fewer proportions of administrators.

In university studies and professional organizations the issue of power has also been treated at the macro level. Parsons and Platt

(1968), for example, argue that professional autonomy (i.e., professional power) is exercised only in the most highly differentiated organizations (i.e., as measured by the GRA index - a combined measure of size, quality and research orientation). However, the assumption that Parsons makes is that medium and low differentiated universities (i.e., those with certain contexts like large size, low research emphasis and low quality) do not approach the ideal typical professional organization, therefore conflict must result. Hrydebrand and Howell (1973) have recently criticized Parsons'(1962) implicit assumption that bureaucratic and professional elements are in "normative" conflict. In addition Bieman and Jencks (1968:266-267) and Demerath et al. (1967:21-27) found that in private universities (i.e., hierarchical - professional) where faculty had more influence, conflict was less. This too suggests that it is not the incompatability of the professional and bureaucrat per se but rather who controls the decisions. In my view, Hrydebrand and Howell (1973) are correct in their assertion that power should be studied as a subsystem or micro phenomena and that professionals can coexist in bureaucracies given the appropriate management style. The importance of this distinction is that it stresses that power should be studied at the subunit level of university. Demerath et al. (1967) have also asserted that the department or school level should constitute the unit of analysis.

Baldridge (1971:507) has fervently appealed to academics to examine the concept of power in universities as a timely topic:

> Anyone who has watched academic decision-making in the last decade can see that powerful external forces are impinging on the university from all sides, tearing at the fabric of

> the academic community and threatening to destroy much of the autonomy that academic institutions have so powerfully built over these years.

As an empirical concept, Child (1972,1973:346) has stressed that the study of power is "possibly the only strategy for research which offers some hope of disentangling the confusion about supportive personnel."

The two best studies concerning the issue of power and innovation vary widely in their approach. Aiken and Hage (1968), in studying the effects of occupational diversity on the degree of innovation, reasoned that their measure of occupational diversity reflected to some degree the power of the social position with the following assumptions and measurement. The first excluded all ranks that were not professional. Secondly, they allowed for "the cancellation of individual errors made by the job occupants of a particular position." In other words, they divided the number of different types of social positions by level and occupation and then summed the scores of occupants and then computed the social position. They then summed all the social positions means for an average score per organization. This had the effect of controlling for level and position, thereby assuring that "undue weight" was not given to lower positions. Therefore, agencies with more administrative professional positions would have the corresponding power reflected in the total organization average score. That is, agencies with higher proportions of administrators would have that level contribute a greater amount to the total mean than agencies with fewer administrative professional positions. In positing these measures as indicating power, they state:

> We make no assumption that the distribution of power, regulations or rewards is random within any particular social position. Instead, each respondent is treated as if he provides a true estimate of the score for a given social position. There is likely to be some distortion due to personality differences or events unique in the history of the organizations, but the composition of means for each social position hopefully eliminates or at least reduces the variation due to such factors.

Quite clearly, they assume decentralization of decision-making, but attempt to "standardize" the organization level, location and department into one score. Their measure does give relative weight to these standardized categories but assumes equity of decision-making across the standardized units of social positions (i.e., administrative vis. production). However, when one examines their measure of occupational diversity more closely, it becomes dubious if it is really the power component of the concept they are interested in; but rather the concept of diversity per se. They note (1970:75) that, "organizations that have high diversity of occupational skills already are likely to have new programs continually suggested by these staffs." (emphasis added)

Hagedorn and Nosll (1973) use a multiple predictive (i.e., regression) model to ascertain the relative effect of professionalization, (i.e., defined at the productive level) and administrative component on innovation. However, they reason that their sample of welfare agencies are "professional organizations" and theoretically (ideally) they should be characterized by decentralization of decision-making. Therefore, their model does predict the relative effect of the administrative and professional components on innovation (i.e., which Aiken and Hage did not do). However, they assume in their measure of the degree of

professionalization (measured as the proportion of that workforce which has a master's degree in social work) that each professional person will have decentralized control over his decisions and, therefore, an organization's professionalization score will reflect the degree of decentralization of decision-making of that organization. By such an assumption they conclude:

> . . .the degree of professionalization of the organization may also be taken to refer at least indirectly to the amount of autonomy exercised by those who do the productive work.

However, they do imply that as the number of hierarchical levels increases, a "distance gap" is created, thereby decreasing the communication between professionals and administrators. This may in turn increase power struggles over the decisions, viz. the need and nature of innovations (defined as programs wigh at least one full time specialist employed). This may well be the case, as "strategic decisions" are usually made by higher level administrators. Therefore, under such conditions, the role of the professional may be reduced to one of professional "suggestions." This latter distinction is important because "suggestions" may imply a form of cooptation. Therefore we face the same dilemma, their measure of the social position does not totally reflect the "power structure." They do note the dilemma and stress that such organizations will be faced with conflict but it still does not reduce the problem of finding a measure of social position that reflects power. However, at the outset of their discussion they reasoned that these new "professionals" would probably not have the same <u>degree</u> of power as the "old" professional in the ideal professional organization. This would, therefore, reduce the validity of their decentralization

assumption, and therefore organizations could have ideally one hundred per cent professionals and yet be powerless. However, they note where such situations would occur, it would reflect poor managerial decisions, but indeed, they do not negate the reality of the need for some humans to control and empire build. Nor does it reduce the problem of a social position's measure to reflect power.

Having explored the conceptual problems, it is obvious in universities that one has to ask if a social position exists that would measure power. Secondly, are the social positions homogeneous so as to be measurable?

As noted previously, the social role of full professor was selected. A good case can be made that this role does indeed reflect the unit of power at the production level (faculty - submit). But before any assertions can be made in regard to the power of this role, it first has to be established that powers are delegated to certain people in organizations. Newman et al. (1972) argue that in organizational analysis, each decision has to be analysed in terms of its strategic, administrative, or operative importance. Baldridge (1971:510-511) argues that issues which reflect the protection of "core technology" will dominate as top faculty priority. This implies that their power will be asserted most strongly in these areas. These include setting goals and task complexity, how the goals will be achieved, and control standards. More specifically, quality of student, curriculum, graduating requirements, research goals and recruiting will be dearest to business school faculty. Decisions regarding research bureaus certainly fall into this category.

The question as to whether the high level professors represents power is well documented. The full professor derives his power from economic, political and social spheres. Firstly, in economic terms, full professors are usually tenured, and this gives them economic security. Moreover, major faculty committees are usually composed primarily of full professors. Secondly, Riesman (1958) and Caplow (1964) have noted the tendency for many universities to view high level "quality" institutions as a bench mark. Rowley et al. (1965) propose that the structures of most universities follow a set "institutional" pattern. Indeed the higher quality universities set the pattern and, therefore, ideas, trends, innovations, and patterns flow through the system (macro) from top to bottom. One major structural characteristic which is viewed closely is the quality of the faculty of which one indicator is the proportion of full professors. Jacob, (1974:54) has recently noted, "Each great man on the staff adds another increment of prestige to the institution's status." This has important ramifications for senior faculty power. To be sure, the system becomes much more competitive, as top rate professors are a scarce commodity. Hage and Aiken (1970:84-85) have noted that such a situation increases the bargaining power of top professors. Next, full professors are most likely to have the charisma and connections to attract high quality people. They have more professional social connections and probably frequent professional meetings regularly. Moreover, the first question a top recruitee is likely to ask is who makes the major decisions? Business schools with higher proportions of full professors are likely to have more say in policy and this would also attract a top man.

Another economic factor would be the ability to attract research funds. Many grants are appropriated on the basis of quality of proposal and reputation. The implications of this are twofold, as Clark (1968) notes:

> An increase in the total amount of funds in a system, as well as funds available specifically for innovation, implies a number of structural changes most evident in the freedom of higher-level individuals to experiment unhampered by small budgets. Less obvious, but equally significant, is that as funds increase, more generous support can be provided to all members of the system. This in turn changes relationships throughout the system, but the impact is particularly marked on lower-level members, who become more autonomous with increasing funds. A larger proportion of persons in the system is thereby able to engage in potentially innovative activities. (emphasis added)

Therefore, greater proportions of first rank faculty makes the system more autonomous and innovative. Therefore the process accelerates, autonomy begets autonomy.

First-rank faculty also derive political power, due to their probable affiliation with professional associations. Moreover, many (Baldridge, 1971) professional associations insist that "only they have the right to judge the competency of their disciplines, and in many cases are able to ward off incursions by non-professionals." Therefore, schools with higher proportions of top rank faculty are likely to be "more" insulated from external or central controls; thereby enhancing the power of their input at the subunit level. Indeed, academic freedom is one of the most cherished aspects of a professor's value system.

Finally, full professors derive power on a social basis. Western society is notable for its respect for rank and authority. This deference alone engenders certain referent power. Aside from this,

though, the full professor has probably excelled in his discipline, been active in committees, has greater seniority, and coupled with the economic and political aspects above probably gives them much internal faculty, administrative and external local, national and even international respect. These factors give the school goodwill or add to its relative position in the "organization set." When you hear of a high rate business school, you usually hear the name of an accomplished scholar first. Clearly, this goodwill loss of first rate faculty can be high.

All the aforementioned factors which have stressed the power in the rank of full professor will increase cost of their replaceability and dispensability (Georgiou, 1973:307). Therefore, since the image, economic contributions, and quality of student (*i.e.*, uncertainty) are all mainly determined by the first-rank faculty, then, as Perrow (1961) suggests, this social unit will have the dominant power. Moreover, Hickson, Hennings, Lee, Schneck, and Pennings (1971) stress that the effects of this power should be greater in an environment with fewer external controls. The implications for private and state control are clear. Moreover, policy issues of which there was general academic consensus such as protection of autonomy, viz. "core" decisions would certainly indicate little fragmentation within this group.

Georgiou (1973:306) has recently presented a model of organization change in which incentives of various organization members and groups rather than broad overall organization goals should constitute the unit of analysis. He further reasons that it is the combination of market conditions, the situation, and incentives of various organization actors

which will determine the "power" structure at any one time. Therefore, he reasons that "categories" of members within organizations and the perceived power that those categories possess, viz. their goals are the units that should constitute the focal point for the unit of analysis in organization analysis:

> Empirical studies of a wide variety of organizations already provide considerable material for identifying such categories, and would allow general statements to be made how members of such categories are likely to behave in various organizations. The great many findings that have come from investigations of professionals suggest the possibilities, much is known about the rewards sought by professionals, in organizations and the consequences of these for the organization. . . . Furthermore, the category of professionals can be differentiated and refined into various types. . . . (emphasis added)

He implies here that there could be different categories of professionals in organizations with different goals and incentives with differing degrees of power. This view differs from Tyler's (1973) approach which combines the number of unreplaceable (based on skill) occupations into one index denoting the division of labor. Tyler then postulates that the greater the number of unrelaceable specialisms may constitute a basis of power in the form of a "dominant coalition." The problem is that Tyler assumes power will accompany an unreplaceable role and therefore the greater the number of unreplaceable roles the greater the power. The ambiguity arises because Tyler (1973) and Heydebrand (1973) do not distinguish between power over the nature of one's job as compared to power in influencing policy. Moreover, both assume that one form of power will carry over into the other areas. Therefore, if innovation is to be the dependent variable, then equating power with the division of labor (i.e., number of unreplaceable

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specialists - Tylor (1973) or with the degree of "professionalization" of the productive component - the proportion of professions in the organization labor force) negates the important point that the political process involves other forces. Therefore, Tylor (1973) does not recognize the nature or degree of skill (i.e., he only distinguishes between nurses and doctors in terms of unreplacability of the skill) whereas Heydebrand does not recognize the number of types of skills (doctors and nurses) or the degrees of these other types of skills (i.e., proportion of doctors and nurses) across levels (i.e., he measures the number of administrative levels rather than the degree of professionalization in those levels). It is clear that the political process will transcend levels, degrees of types of expertise, and numbers of different types of experts. The question really reduces to the fact that if we want to account for the variation of innovation in organizations, we have to find a measure that is not tied to the division of labor (number of types) or degree of professionalization or administrative production levels.

Hage and Dewar (1973) have recently examined the degree of innovation in terms of the power structure. The important finding is that in welfare agencies, the power structure was composed of <u>both</u> administrative and productive personnel whose values had a high propensity for change. Moreover, they found that the combined administrative production measure was greater than individual measures of the administrative and production components. Moreover, they found that this measure was independent of the occupational diversity measure of structure, and that <u>both</u> measures contributed to the variation of the

degree of innovation explained.

The implications of the above analysis for this study are that focusing on the power structure (and their values toward change) did not tie them to level of "expertise" or "diversity of expertise" concepts and measures. It is important to realize that the conceptual foundation of their study was built on Thompson's (1967) "inner circle" concept. However, it is important to recognize that the "inner circle" or power structure in welfare agencies was conceptualized as those who reported they were "always" involved in decisions. There is strong reason, however, to believe that the power structure in universities can be conceptualized in different terms than in welfare agencies.

Firstly, the goals of a graduate degree granting university are more diverse. The goals as centered around creation and application of knowledge suggests diversity as compared to rehabilitation (i.e., application of behavioral science theories) in welfare agencies.

Moreover, because the market for social workers is flooded, it creates a situation whereby all employees are replaceable. However, the academic market is not flooded with high quality proven scholars. Therefore, in welfare agencies the emergence of a power structure is most likely to be based on personalities. Therefore, the emergence of a collective or social unit as comprising the inner circle is less likely. In universities, however, as previously noted, full professors are likely, individually, to gain power and theoretically and conceptually can be expected to exert a strong influence. Further, it would be more risky for "senior" employees in a welfare agency to collectively exert their influence in policy (i.e., due to the market supply).

Moreover, since the rank of full professor is an organizational rank, the degree of full professors would represent an organizational structural measure of power, thereby representing an aggregate degree of top level expertise.

Therefore, unlike Hage and Dewar who measure welfare employee values towards change; it will be assumed for this study that all faculty will value innovation, but that the full professors will have the best power position to actualize these innovations. It is important to realize that the goal rehabilitation (application of knowledge) in a welfare agency may restrict the degree to which innovation is valued. However, the creation of knowledge (research) as one goal in universities which offer graduate studies, would clearly imply that innovation is a commonly held value. Moreover, Baldridge (1971) argues that faculty will strive to have innovations "institutionalized" as one coping strategy to enhance their legitimacy and hence autonomy. Moreover, this common professional value as a normative concept (Parsons, 1949) has been so strongly entrenched that it has been the basis of establishing professional organizations as ideal typical organizations (Heydebrand and Noell, 1973). Moreover, as Heydebrand and Noell (1973:302) stress, "expansion means an increase in professional power." In summary, there is reason to believe that all professors highly value innovation and, therefore, it is not the degree of value orientation but the collective power of the full professors that constitute the inner circle. This, therefore, reduces the measurement of the power structure (in terms of innovation) to a structural measure (i.e., the relative size of full professors as compared to the total size of the faculty). It should be

stressed also that these innovations are in the "creation" of knowledge rather than the application area.

In terms of a hypothesis, then, it can be strongly asserted that business schools with higher proportions of full professors will attract more grants (i.e., economic power) and correspondingly have more political power to formally institutionalize their power into legitimate innovative specialisms. Hypothesis 22 can now be stated:

22. The larger the proportion of full professors (professional activity) the greater the number of research bureaus and programs, and this relationship will be consistent for private, state, and Canadian samples.

The Carnegie Commission (1972:69) found that the median classroom hours per week for faculty members in private research universities were less (i.e., public-- six hours, private-- 5.2 hours) than public universities.[5] In addition, Gross and Grambsch (1968:48) found that private universities stressed, to a greater degree, the goal to "give faculty maximum opportunity to pursue careers." This goal, measured as perceived rather than preferred, was found to be significant at the .05 gamma level across the private university sample. Across the state supported universities, this goal was insignificant. In short, since full professors in private schools have more time to do research, coupled with the goal of giving them maximum opportunity to pursue their careers, is really a manifestation of their collective power being greater than full professors in state schools. Moreover, the reason why private school full professors may have more control is due to the diversity and nature of the funding in their system. The addition of research bureaus

is more than just an indicator of innovation. In many cases, full professors spend most or all of their time with the bureaus, as directors or associates. Therefore, the addition of bureaus really represents a shift of "output goals" from students to research. Moreover, because of less external pressure, the tendency will be more pronounced in private schools. Perrow (1970:140) notes:

> Now, when the 'intellectual' has become a distinct class or status group (35), the demands are that universities be concerned primarily with knowledge rather than with training. Such a shift in goals will be hardwon, if it is to occur, and perhaps it can only be achieved by means of specialized institutions that will train intellectuals to continually subject society to critical analysis. At the same time, most universities and colleges will continue to train the specialists needed to run a high-energy technology and a complex society. But there is no doubt that in the meantime this controversy over the proper goals of universities contributes to an unprecedented turnover of university presidents, who are caught between the demands of business-oriented trustees and legislators on the one hand, and faculty and student intellectuals on the other. (emphasis added)

Perrow's comment applies to state controlled universities, and implies that a shift to research (e.g., training of students for creation of knowledge) rather than application of knowledge (i.e., teaching students existing knowledge). Therefore, hypothesis 23 can be stated:

23. The relationship of hypothesis 22 will be greater in private schools than for state schools.

In the Canadian and state context, given the lack of support by Canadian universities by alumni, corporations, and endowments, hypothesis 24 can be stated as:

24. The relationship of hypothesis 22 will be greater in state schools than for Canadian schools.

That is, Canadian universities, because of less external support (aside from Federal funding), will have a lesser degree of professionalization associated with the institutionalization of research bureaus and programs based on the combined-process model criteria.

In terms of sheer numbers, Ben David (1968:20) postulates a positive relationship between faculty size and the number of bureaus:

> The size of the American department and the presence of a number of professors within it made possible the growth of the department, and within the department the formation of independent research units composed of one or several teachers or graduate students. (emphasis added)

In many other studies across organizations, the subunit size and complexity hypothesis has been consistently positive. Pugh et al. (1969), in manufacturing organization, Blau (1970), in manufacturing and service organizations, Roland (1971:58), in public universities, and Scott and El-Assal (1969), in public universities, all found the relationship positive. Although the measures of complexity have varied a great deal across samples, the direction and association have been strong and positive. Accordingly, hypothesis 25 will be stated as:

25. The larger the size of the business faculty, the greater the number of research bureaus and program specialisms, and this relationship will be consistent across all three samples.

The size of the parent institution must also be considered a major variable in association with the number of non-internal differentiated growth specialisms (i.e., bureaus and programs). In studies across manufacturing and service organizations, Child (1973) found a significant positive relationship between size of the parent and

functional specialization. Hypothesis 26 can therefore be stated as:

26. As the parent size of an institution increases, so will the number of research bureaus and programs, and this relationship will be consistent across all three samples.

Technology must also be considered a key variable when considering these heterogeneous type of specialisms. Clearly, the greater the relative number of graduate students, the greater will be the tendency for such institutions to attract federal grants and private research contracts. This tendency may cause a greater number of non-differentiated growth specialisms. Hypothesis 27 can be stated as:

27. The greater the materials technology (i.e., the relative number of graduate students), the greater the number of research bureaus and programs.

Due to the previously noted greater emphasis for graduate education across private universities (Gross and Grambsch, 1968:48), coupled with the Carnegie Commission's (1972:38) findings of greater costs of organized research per FTE in private research universities, leads one to the conclusion that this relationship may not tie the same across samples. Moreover, Gross and Grambsch (1968:66) found that the <u>most striking</u> difference between private and state preferred goals (i.e., they found little difference between the preferred and perceived status of this goal) was the private university respondents to:

> . . .say that the institution should <u>accommodate</u> only the <u>best</u> students (gamma = .938, within-university analysis), where as those at public universities say that the institution should do its best to educate <u>all</u> legally qualified high school graduates (gamma = .930, within-university analysis). (emphasis added)

If their findings are correct there could be a greater tendency for private business schools to provide research bureaus and first rank faculty members to attract and accommodate increasing proportions of graduate students. On the other hand, the relationship could be spurious; that is, private universities with greater proportions of graduate students accommodate and attract those students with first rank faculty who, in turn, attract funds and set up the bureaus. Clearly, the result can only be determined empirically; therefore, hypothesis 28 can be stated as:

28. The relationship of hypothesis twenty-seven will be greater in private schools than in state schools.

Due to the hypothesized fewer number of research bureaus and programs in Canadian universities (i.e., due to less external support and a lower degree of competition in the entire Canadian university system), hypothesis 29 can be stated as:

29. The relationship of hypothesis twenty-seven will be greater in state schools than in Canadian schools.

Recently, more research in organization theory has focused on the relative importance of contextual variables (size, technology, and dependence) in predicting structure.[6] Boland (1969:59) makes a case for size as being far more important than technology in determining university structure. Unfortunately, he holds technology constant by assuming that it does not vary in universities. This is clearly not the case in the multi-university with very heterogeneous technologies and departments. His conclusions must be treated with caution. Moreover, in many cases, research approaches have tended to stress one variable

at the exclusion of others. In approaching this limitation, it was stated at the outset that one purpose of this thesis was to include age, size, technology, professional activity, parent size, and type of control simultaneously in a predictive model.[7]

In studies employing innovation as the dependent variable, Hage and Aiken (1973:318) found task diversity and then professionalization (as measured by the number of branches) to be the best predictors of innovation. Hage and Dewar (1973) found that the "inner circle" or power structure (i.e., as measured across lines of authority, as those who always participated in the decision making) was the best predictor of innovation. Others who have not focused on the power structure found that the number of diverse types of professionals was the best predictor (Aiken and Hage, 1968).

The consensus for this study is that the power structure; that is, degree of expert-professionals, will be the best predictor, then size, then materials technology. However, in "support" specialisms, to be discussed, a different ordering will be hypothesized. Hypothesis thirty will be stated as:

30. Professionalization will have a stronger association with innovative growth specialisms than size and technology and these relationships will be consistent across samples.

It will be recalled that the type of control variable was conceptualized as a dummy variable, and included in a predictive equation, (as for professional activity) measures the effect of private and state control per se when the other predictive variables are controlled. Therefore, hypotheses 31 and 32 can be stated as:

31.a Private business schools will have a significantly greater proportion of external growth specialisms than state schools even when technology, parent size, submit size, and professional activity are controlled (i.e., are included in the same equation).

32. State business schools will have a significantly greater proportion of external growth specialisms than Canadian schools even when technology, parent size, submit size, and professional activity are controlled (i.e., are included in the same equation).

The following schematic diagrams summarize the hypothesis relating to innovative growth specialisms.

FIGURE 3: Hypothesis with Innovative Growth Specialisms for Private-State Comparisons.[8]

( )^{S} = state
( )^{P} = private

FIGURE 4: Hypothesis with Innovative Growth Specialisms for Canadian-state Comparisons.

( )^{c} = Canadian

( )^{s} = state

Intercept Differentiated Growth Specialisms

Specialisms added due to the growth of existing specialisms (i.e., following Clark's (1968) differentiation model) is the second measure of differentiation. Previously, it was noted that specialisms added in this way would have different implications for organization structure (for example, as in the case of an admissions and placement function evolving from a student affairs function). This has been the model primarily used in organization theory to study differentiation in organizations.[9]

There is reason to expect that these specialisms will vary across our samples of private, state, and Canadian universities. The Carnegie

Commission (1972:133) reasons that private universities will have a greater number of "support" functions due to their increased concern for selection and recruitment of students. Moreover, Gross and Grambsch (1968:66) found that the "most striking" difference between private and state universities was the former's tendency to recruit the most qualified students (gamma = .879, across university samples). In contrast, this goal was insignificant for the state sample. Moreover, they also found that state universities (across state samples) emphasized the goal of "keeping costs down" (gamma = .626). In contrast, the goal was insignificant for the private sample. This finding would appear to be relevant when one considers Pondy's (1969) finding in manufacturing industries, that the goal seeking behaviour of management (i.e., under ownership and non-ownership control) was an important variable in determining preference for professional management specialists. Further, the greater competition for funds in the private system must be considered another important factor in contributing to greater support differentiation. Other factors must also be considered. For example, the greater tendency (Gross and Grambsch, 1968:48) for private university administration and faculty to "protect academic freedom" (gamma = .627) across university samples) by specializing "boundary roles" (Baldridge, 1971:525).

Empirically, O'Neill (1971:46) found that the mean number of professional staff for student personnel services per 1,000 full-time equivalent students, was greater in private (5.6) than in public universities (4.5). It will be hypothesized that this support differentiation will occur at the business school level. Therefore, hypothesis 33 can

be stated as:

33. There will be a greater mean number of support specialisms in private business schools as compared to state business schools.

Due to the hypothesized slower growth in Canadian universities and less competition in the university system as a whole, hypothesis 34 can be stated as:

34. There will be a greater mean number of support specialisms in state business schools as compared to Canadian business schools.

In predicting this dimension of differentiation; size, age, parent size, technology, professional activity, and type of control must all be considered. In terms of age, Ford (1963) found at Purdue University that the financial allocation of resources to administrative activities increased with time and this effect was independent of size. He found this in contrast to financial resources for research activities. Hypothesis 35 can now be stated as:

35. The older the business school, the greater the number of specialisms added due to growth of existing specialisms, and this relationship will be consistent across all three subsamples.

In terms of the variable parent size, Scott and El Assal (1969) and Corson (1960:87) reason that as the parent size of an institution grows, so do the number of specialisms at the department level. As Corson (1960) notes:

> As a result of institutional size and of this specialization the initiative for a great deal of educational policy, for personnel appointments and evaluation, and for budgeting of equipment and educational facilities, has shifted to departments. (emphasis added)

Hypothesis 36 can, therefore, be stated as:

36. The larger the institutional size, the greater the number of specialisms added due to the growth of existing specialisms, and relationship will be consistent across all three subsamples.

As previously noted, faculty size (submit size) and its positive relationship to functional specialization has been intensely studied across all types of organizations. Roland (1969:59), in tax-supported universities, strongly asserts this relationship:

> . . .it is reasonable to argue that the demands of numbers 'force' these institutions to make use of an organizational model which places heavy reliance on 'expertise.'

More recently, the Carnegie Commission (1972:62) notes:

> . . .the size of the faculty tends to determine the need for other types of expenditures such as those for support personnel library volumes, computer expense and office space. (emphasis added)

In many other studies across organizations, the submit size and differentiation hypothesis has been consistently positive. Pugh et al. (1969), in manufacturing organizations, Blau (1970), in government employment agencies, Child (1973), in manufacturing and service organizations, Roland (1971:58), in public universities, and Scott and El-Assal (1969) in public universities, all found the relationship positive. Although the measures of complexity have varied a great deal across samples, the direction and association have been strong and positive.

However, technology may appear to be a factor influencing this relationship. Hall (1972:119) argues that the relationship between differentiation and size may not hold if technology is "built around non-standard products and services." His argument here implies that when technology is non-routine, relatively greater input-output specialisms are needed for effective performance. Therefore, as in the case of routine technology, size (through economies of scale) cannot cause tasks to be divided minutely. Clearly, the larger the proportion of graduate students may confound the size-differentiation relationship in universities. However, our analysis, as will be later shown, will be based on multiple regression and the relative effect of both technology and size will be examined. Child (1968:533), in conversation with Blau, sheds further light on confounding effects.

> Peter Blau, in personal conversation, expressed the view that size is important in all organizations, but that it must be 'washed out' [sic], i.e., it is a reflection of other changes. If these other changes are examined, the impact of size as an independent variable may disappear.

Child (1973), in a sample of British service and manufacturing industries, found that size did not "wash out" when technology was included as an independent variable on complexity. Therefore, following the Carnegie Commission (1972:62) there is still reason to believe that size will be associated with support differentiation independently of technology.

It is the view of this thesis that the effects of size will not "wash out." Accordingly, hypothesis number 37 can be stated as:

37. The larger the size of the business faculty, the greater the number of specialisms added due to the growth of existing specialisms, and this relationship will be consistent across all three.

In terms of professionalization as an independent variable on support differentiation, some inconsistencies exist in the literature. The first view is taken by those who postulate that as the degree of professionalization increases the proportion of administrators will decrease. The underlying theoretical assumption of this view follows Parsons (1949) that professional norms and values are basically incompatible with bureaucratic elements, and accordingly, professionals will insist on defining and coordinating their own goals. Such a view, however, assumes a technology whereby the professional task is independent of an integrated work process. Moreover, Gross (1968) has shown that faculty and administrators feel that academic freedom "is" and "should be" the primary goal of a university. The finding was consistent for his combined sample of private and state universities. Moreover, Barber (1968) stresses the "scorn" of faculty toward administrative specialisms as an encroachment on the collegiality form of organization. Therefore, according to this view, the greater the academic freedom, coupled with the scorn of professionals for "bureaucratic" positions, will result in greater proportions of full professors resisting the formation of administrative specialisms. Empirically, support for this view is shown by Udy (1959:794), Stinchcombe (1959) and Blau (1968) who argue that the emergence of administrative specialisms and central controls will be inconsistent with professional values and thereby create conflict. In universities Etzioni (1959:62) and Scott (1966:266) argue this case in universities. Empirical support for these views is shown by Darkenwald (1969).

The second view expressed by the Carnegie Commission (1973:81,131) notes that faculty time is too valuable to be spent on "drafting letters in support of promotions, working out course and committee assignments with faculty members and the like," and that a "corps of middle managers" would help alleviate this problem. To whom these duties will affect the relationship between professional activity and number of "middle managers" (personal growth specialists). The basic assumption underlying this view is [illegible]

[illegible]

and controls. However, this is quite clearly what is not occurring. The nature of administrative specialists that are emerging are administrative placement, client, student affairs, and library type of specialists which largely represent in part conflict over students and some types of funding. However, these functions usually have fewer line authority over the base of university. Therefore, the view taken in this study will be that the professors still control the institutions of administration and allocate rich decision making power. However, the main emphasis is on the decision making and authority of a few. Thus, the first and second hypotheses have been taken as a support for affirming these two hypotheses. Thus, the hypothesis 3 is also true.

The impact of degree of institutionalization on the types of administrative support specialists

In addition, the type of specialist with more institutionalized variables, that are more professional, and have more specialized administrative and in turn having the role with authority, certainly which is the [illegible] functions this type of specialist and the [illegible] power. In the case of [illegible] such students, student affairs, and library specialists and those professionals more specialized in health and administration in the [illegible]. These findings indicate that the academic [illegible] specialists in state universities have

[illegible]

[illegible]

In conclusion, distinction must be made between private and state

systems. It has been hypothesized hitherto, with some empirical substantiation, that private business schools have more autonomy because of the lack of central controls (i.e., due to the nature and diversity of funding). Therefore, the real issue at the private level is, still, the decisions be performed by the addition of administrative specialisms or committees. However, at the state and Canadian levels, the issue is between central control or decentralized control in which event the addition of a specialism at the department level would represent the "specialization" of a boundary role to act as a legitimate buffer against central control, as a coping mechanism (Baldridge, 1971). Therefore, in the state system, the addition of a specialism would represent the lessor of two evils. Therefore hypothesis [illegible] can be stated as:

[illegible] The relationship in hypothesis [illegible] will be less intense in state and Canadian business schools than in the private system.

Materials technology [illegible] considered as a [illegible] in predicting support differentiation in the form of internal growth specialisms. Thompson ([illegible]) argues that when task complexity is increased, more administrative functions are needed to regulate [illegible] of input and output. Woodward ([illegible]), in a sample of [illegible] hospitals, [illegible] Thompson's ([illegible]) proposition. He showed that hospitals with more varied forms of "raw materials" (i.e., general hospitals) with teaching as an added function) had a higher level of functional and departmental specialization than psychiatric hospitals (i.e., which also included teaching as an added function). In universities, the Carnegie Commission ([illegible]) supports

this view and notes that the more constrictive the task environment (i.e., the more emphasis on graduate training), the greater internal growth specialisms (complexity). It notes:

> At the PhD stage, however, and especially in connection with placement in academic institutions, the recruiting department will want to communicate directly with the department in which the graduate student is being trained, and faculty members will inevitably be involved in providing written or oral recommendations, even though details of the placement program may be handled by a non-faculty member.

As previously noted, [illegible] found the "most striking" difference [illegible] private and state universities was the emphasis on selecting [illegible] students, as compared to all legally available students. [illegible] this connection, it [illegible] that one would expect that private schools with greater proportions of graduate students would be [illegible] by increasing numbers of administrative support specialisms [illegible] greater [illegible] [illegible].

The [illegible] and [illegible] Hypothesis [illegible] can be stated as:

[illegible] The greater the [illegible], the greater the number of support specialisms.

As previously stated, due to the greater emphasis on graduate [illegible] and [illegible], hypothesis [illegible] can be stated as:

[illegible] The [illegible] of hypothesis [illegible] will be greater in private business schools than in state business schools.

Also, as previously noted, due to the different stages of development, greater competition and [illegible] of [illegible] in the American system, as compared to the Canadian system, hypothesis [illegible] can be stated as:

42. The relationship of hypothesis forty will be greater in the state business schools as compared to Canadian schools.

It will be recalled that the type of control variable conceptualized as a dummy variable and included in a predictive equation (as for non-internal growth complexity), measures the effect of private and state control when the other predictive variables are controlled. Therefore, hypotheses 43 and 44 can be stated as:

43. Private business schools will have a significantly greater proportion of internal support specialisms than state schools, even when technology, parent size, subunit size, and professionalization are controlled (i.e. are included in the same equation).

44. State business schools will have a significantly greater proportion of internal support specialisms than Canadian business schools, even when technology, parent size, subunit size and professionalization are controlled (i.e. are included in the same equation).

It was proposed in the section on non-internal growth specialisms that professionalization and size would have a greater effect on that dimension of complexity than technology. However, Dickson et al. (1969) predicted that technology would have its greatest impact on structure when size was less than one hundred. Moreover, he said this effect would be more pronounced on those specialisms directly related to the workflow. However, hypothesis 45 will still state as:[11]

[illegible] Size will have a stronger association with internal support specialisms than technology but less than professionalisation and those relationships will be consistent across samples.

However, given the definition of internal support specialisms as those specialisms added due to the growth of existing specialisms, implies that size would have a stronger impact on internal support specialisms, than innovative specialisms. Starbuck (1965:[illegible]) alludes to the effect of the innovative growth specialisms (rather than specialisms added from expanding, existing specialisms) by being "independent" of the size of the whole organization. However, Paint (1970:[illegible]), in modifying Starbuck's (1965) view, argues that size will still have an effect:

> The choice of one or the other of Clark's models is therefore going to affect any relationship that may be found to exist between specialisation, size, and history. However, though the application of the 'organic growth' model may yield a different set of specialisms from 'differentiation,' it is not expected that, should it be chosen, the effect of size or specialisation will be insignificant. (Emphasis added)

Hypothesis [illegible] can be stated as:

[illegible] The effect of size will be greater in predicting internal differentiated support specialisms than innovative specialisms, and this relationship will be constant across all three samples.

The following schematic figures summarize the hypotheses relating to internal support specialisms.

FIGURE 1: Hypothesis with Internal Support Specialisms for Private-State Comparisons

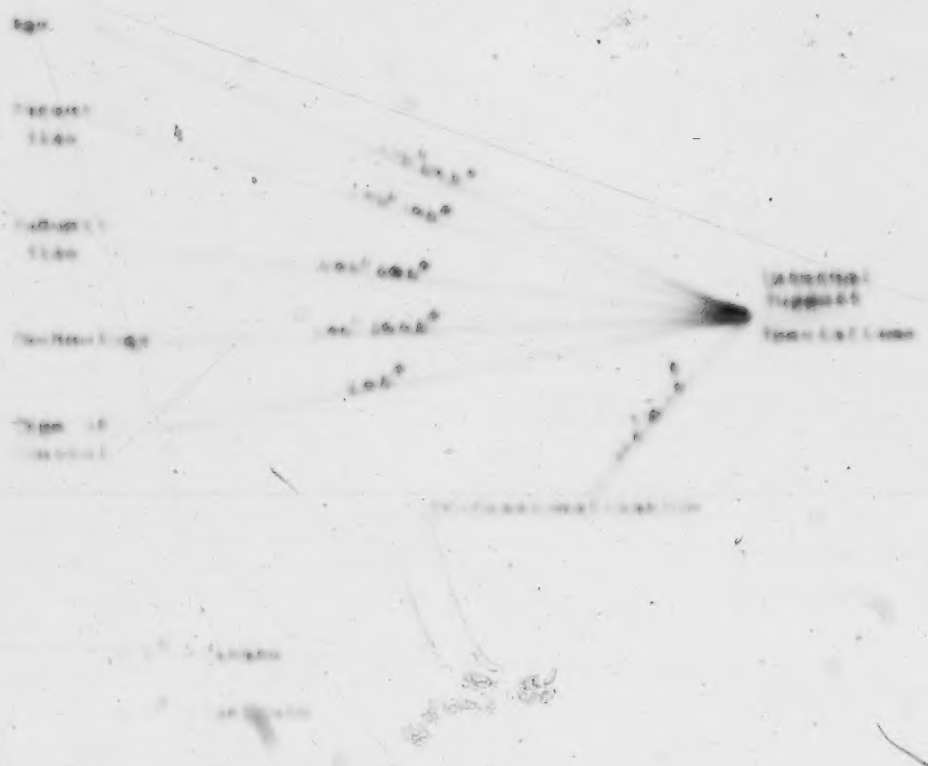
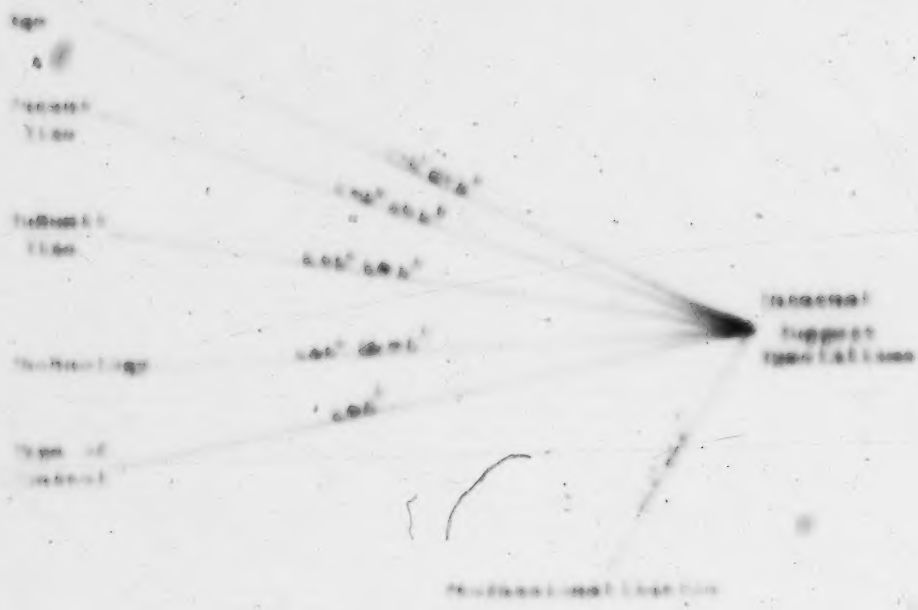


FIGURE 5 Hypothesis with Internal Support Specialisms

For State-Canadian Comparisons [1]



[1] = Canadian

[2] = State

In view of the similarity of the above approaches to the measurement of the concept of administrative component, it was decided to also measure the concept as a ratio. For the purposes of this study, the concept of administrative component will be defined as the ratio of the total number of administrators to faculty ratio. The administrators included deans, associate and assistant deans. Those involved with support functions (e.g., administrator, placement, student [illegible]) and [illegible] were included.

[illegible]

The [illegible] of administrators [illegible] will be greater in private universities than in state universities.

Due to greater competition and varied sources of incomes in the American system, as compared to the Canadian system, hypothesis of [illegible]

in all classes of organizations. However, when different measures of administrators have been used, different results have been reported in school systems. Goldmeier and Blowers (1971) found a **positive** significant relationship between size and the ratio **professional** administrators. Hawley *et al.* (1983), in their sample of state supported universities, also found a strong positive relationship between size and professional administrative ratio (i.e., they used a multiple regression equation which included complexity). Finally, Starbuck (1981) [illegible] reasons that the relationship between size and administration will still be positive when size is under one hundred. However, Blau's *et al.* (1988) findings in small government bureaucracies do not support Starbuck as they noted that the relationship between size and administration will end negative. More recently, the Carnegie Commission (1972) [illegible] found in a sample of comprehensive universities and colleges that as size measured by total enrollment increased, the general institutional expenditures plus student services expenses per FTE student decreased.

General explanations for this hypothesized negative relationship have been offered. Hushing (1981) maintains that as organizations grow without complexity (i.e., by adding specialisms of a type that already exist) the administrative component still uses the same personnel for the expanded volume. As a result, the proportion of administrators given over to this expanded volume will increase at a slower rate than for other forms of growth. Pondy (1969), however, offers a different view to maintains that as size increases, the proportion of administrators decreases, and this effect can be explained **quite** with reference to

[illegible] of the [illegible] tends to minimize the need for other types of expenditures such as those for [illegible] library volumes, computer expenses, and office space. There is a tendency for [illegible] expenditures reflecting products such as [illegible] although the converse is not true. [illegible] [illegible] (emphasis added)

However, the Carnegie Commission (1971-1972) estimating the negative relationship reflects economies of scale in higher education. Therefore, contemplating the above items for universities, it will be argued that due to the greater stress in the private university systems for quality (as compared to state) and the relatively greater concern for costs in the state system (as compared to private) (Gross, 1968), the following deductions evolve. State schools will be more bound to the goal of rationality. Therefore, increasing size will accompany greater support specialisms, but to a lesser degree than in the private system, thereby creating economies of scale. Therefore, the lower degree of complexity will require proportionately fewer administrators. In the private systems it can be reasoned that the greater emphasis on quality with increasing size will cause an increase in support specialisms (to a greater degree than in the state system) and qualified administrators to staff the specialisms. Therefore, the economies of scale will be less than for state schools. In short, state business schools will <u>economically</u> not be able to justify their own building, computer, admissions officers, librarys, to mention but a few. As will be shown later, only multiple regression and analysis of covariance will help solve this enigma. Therefore, hypotheses 50 and 51 can be stated as:

50. As the size of the business faculty increases, the proportion of administrative intensity will decrease.
51. The relationship of hypothesis fifty will be more acute for state and Canadian business schools.

In terms of parent size, Scott and El Assal ([illegible]) found that the larger the parent size, the greater the tendency for administrative functions to be shifted to departments. They note:

> Accordingly (in response to growth, quality and heterogeneity), they expanded their administrative staff personnel--such as vice-presidents, deans, associate deans, department chairmen, associate department chairmen, administrative assistants, secretaries, executive secretaries, clerks, clerical helpers, and consultants. Simultaneously, they formalized and routinized their administrative procedures in order to coordinate and to regulate the granting of examinations, of degrees, of stipends, of scholarships, research on human subjects, teaching and research facilities, housing, extracurricular organizations, teaching schedules, speakers, sports activities, and hiring, termination, promotion and evaluation of personnel.

Therefore, if this statement is correct, it implies that as the size of the parent grows, so will the emergence of decentralized administrative specialisms to foster effective focus of attention (Boland, 1971). Therefore, hypothesis number 52 can be stated as:

52. The larger the parent size, the greater the proportion of administrative to faculty ratio (i.e., at the subunit level) and this relationship will be consistent across all three samples.

PROFESSIONALIZATION AND ADMINISTRATIVE COMPONENT

It should be kept in mind that the administrative faculty ratio really represents a measure of efficiency. That is, proportionate increases of staff as contrasted to line functions. Empirically, in a sample of hospitals, Heydebrand (1973) found that a varied materials technology (i.e., a general hospital) was positively associated with an

increasing number of diverse specialisms and therefore a higher degree of diversified professional nurses (professionalization). Moreover, he notes that this higher degree of professional diversity will require proportionately more numbers of administrators in a coordinating capacity, thereby accounting for the positive relationship of "professionalization" on administrative intensity. However, Heydebrand's (1973:132) discussion of increased task complexity or materials technology (i.e., general vs. psychiatric) is confused. He reasons that a task complex environment will increase specificity of functions of professionals and thereby require more coordinating administrative specialists. This is similar to comparing a business school that exclusively offered graduate accounting with a school that offered undergraduate marketing, finance and accounting, and that the professors of the latter would have more specialized roles. Not likely, the latter school would have a <u>greater number</u> of <u>diversified</u> specialized roles, but the <u>nature</u> of the role would be no more specific than the former. Therefore, qualifying Heydebrand's (1973) analysis, it can be reformulated as follows: that general hospitals with higher proportions of professional nurses (i.e., controlling for diversity) will <u>not</u> require higher proportions of administrators in a coordinating capacity. Therefore, the positive association can be a reflection of either the hospital policy, viz. staffing quality (i.e., which would render the association spurious) or that higher proportions of nurses have the power to demand, for example, that the "dirty" part of their job be handled by orderlies and/or the administrative part of their job by a head nurse. In either case, all three factors would contribute to

administration-ownership.

In business schools, larger proportions of full professors (i.e., power structure-inner circle) would affect proportions of administrators in a variety of ways. As noted earlier, three schools of thought emerge. Firstly, Parsons (1969), Stinchcombe (1959), Scott (1966) and Etzioni (1959) all argue that professional values are inherently in conflict with bureaucratic modes of coordination. Another group, Gouldner (1957), Hasting and Hinnings (1969) and Box and Cotgrove (1966) reason that within a given profession, the professional values can vary from one value to the next in terms of degree of compatibility with bureaucracy. This group basically asserts that man's attitudes and values are capable of changing and that different situations can affect various degree of compatibility with bureaucracy. More specifically, Hastings and Hinnings (1969:15), found empirical support for the proposition that as the power of the local community and/or superior over a professional accountant increased; (i.e., only if role expectations of the former groups were incompatible with the professional values of the accountant) so would the tendency for the professional to minimize conflict by suppressing commitment to professional norms and values. Under such conditions, one would expect professionals to identify with the institution (i.e., locals) and administration. Under such situations, incentives, rewards and rank may be expected to be a function of how the institution/administration (i.e., bureaucracy) view the goals of the university (i.e., and therefore role expectations of professors).

The third school, Heydebrand (1973) and Heydebrand and Noell

[illegible] reason that [illegible] the creation of a new type of professional whose [illegible] is part of a local work process. Under such conditions, incompatibilities between professionals and bureaucratic structures exist, not only when the [illegible] of power [illegible] the professional either a) reduces role discretion and/or b) is asserted by a superior which stresses bureaucratic (efficiency) expectations.

Synthesizing these views so as to apply to private and state, Canadian business schools results in several salient factors. Firstly, Heydebrand's view has to be rejected because he views the new "technical" professional as his premise, and thereby assumes that conflict results when discretion over role and policy are centralized. In contrast, Perrow's (1970) "dissent on technology" stresses that policy will be formulated by an ongoing power structure. This power structure will consist of those individuals or groups that contribute most to the organization's sustenance. Therefore, irregardless of whether professionals have one hundred percent autonomy over their own role does not imply that they will have any more say in policy. Policy will be in the hands of the "elites" which may or may not be professionals. Therefore only two theories emerge which can viably explain the relationship of the power structure or inner circle to proportions of administrators (i.e., bureaucratic specialists) in private versus state controlled systems.

Hastings and Hinnings' (1969) view which expands on Gouldner's (1957) cosmopolitan-local dichotomy, is one relevant for state and Canadian schools. Specifically when external environmental pressures

(e.g., legislators and trustees) threaten professional autonomy (Hartnett (1971:139), Gross (1968:341)). Hastings and Hinnings reason that the reward system will stress administrative and faculty behavior to accommodate closely with state goals (i.e., undergraduate emphasis, costs, and teaching) which are opposite to professional goals (e.g., quality, effectiveness, graduate emphasis and research). It is at this point where either the views expressed by Parsons (1949), Etzioni (1959) and Scott (1966) or those expressed by Hastings and Hinnings (1969) and Bos and Cotgrove (1966) will emerge as salient in predicting professional behaviour. The former group would stress that professional incompatibility would prevail (i.e., cosmopolitan orientation would be maintained). Consequently, the coping mechanism that would emerge could be expected to take the form stressed by Baldridge (1971) where the faculty power structure would strive to have boundary roles (i.e., admission, tenure) buffered or legitimized in the form of decentralized, formalized specialisms. Under this model, increasing proportions of full professors could expect to be positively associated with administrative overhead. However, on the Hastings and Hinnings'(1969) assumption, one could expect a "psychological" coping mechanism whereby, administration and faculty would "adapt" their value systems to be more congruent with the state (local). Such a model implies that true cosmopolitans (i.e., those who did not change their values) would either leave, "buck" the system and get fired, pay "lip service" to bureaucratic encroachments, or withdraw. These "patterns of accommodation" to bureaucracy are the essence of Presthus' (1958) model. Therefore, overtime, "local" sanctions would foster and reward the development of "upward mobiles" with value

systems orientated to the institution. It should be stressed that it would be extremely difficult to measure local or cosmopolitan value orientation as many professors would "ideally" espouse cosmopolitan values. Clearly a perceptual gap, either conscious or subconscious would bias responses. Therefore, where we assumed homogeneous professional values for research and innovation in the previous section, in contrast, this view stresses various forms of value orientations. Therefore, under the above model, local administrative overhead which accompanies size, complexity and technology would be acceptable to "local" professionals. In this case, one could also expect a positive relationship of full professors with administrative support. However, the latter view was derived from an accounting profession context. Given that the sample in this study contains only graduate offering institutions, tempts one to accept the first view (Parsons, 1960) that full professors have enough mobility and "expertise" power that they will not forsake their professional values. Accordingly, they will not adopt "local" administrative specialisms as a psychological coping mechanism for self preservation. This view is more congruent with Hall's (1970:49) assertion that the faculty "power structures" are those with "perceived competence." Therefore, in graduate orientated institutions, "perceived competence" will most likely manifest itself in "professionally" orientated rather than "bureaucratic" local orientated faculty. Therefore, hypothesis 53 can be stated:

53. For state and Canadian business schools, the larger the number of full professors the less the administrative to faculty ratio.

In the private system, the Parsons (1982), Etzioni (1959) and Scott (1988) model is more likely to be dominant. Specifically, (i.e., as previously noted) because, if the greater stress of a quality, graduate emphasis, maximum opportunity for faculty to pursue their careers, less emphasis on costs, and "best student" emphasis, implies that increases in size and complexity will result in movement toward decentralized "core" decision making. With the reduction of external pressures, viz. bureaucratic demands (costs, teaching and efficiency) professors in private schools will be more highly committed to research and publication, and the reward system will foster this orientation. As a consequence, professors are most likely to <u>even</u> resent the formation of legitimate, formalized, administrative specialisms; even if the latter's role is relegated to information collection. However, it would be expected that many <u>ambivalent</u> views would be held. For example, placement, alumni functions as performed by full-time specialists would enhance effectiveness. Therefore, it should be stressed; it is not the functions per se that will be resented, but rather their formation as a full-time status (i.e., in contrast to that function being handled by faculty committees). Hypothesis 54 can now be stated:

54. The greater the proportion of full professors, the fewer the numbers of administrators in all three samples of business schools; but this relationship will be more intense in private business schools.

<u>TECHNOLOGY AND ADMINISTRATIVE COMPONENT</u>

The same argument adopted for technology, and the number of internal growth specialisms (previously presented) will be adopted for technology and administrative structure.[15] The position, briefly stated

(following Thompson, 1967), is that task requirements which are highly complex, will require proportionately more task centered and coordinating administrative roles. Hypothesis 55 can be stated as

55. The greater the materials technology, the greater the proportion of administrators.

Moreover, it was previously noted that the "most striking" difference in private and state goals was the emphasis in obtaining the "best" students. Therefore, this implies that for maximum effectiveness (Thompson, 1967) administrative specialisms would be created to <u>select</u> (i.e., admissions) and <u>attract</u> (i.e., placement, library, computer), their "best" students. Therefore, holding absolute numbers of graduate students constant, it can be postulated that the increased emphasis on <u>quality</u> of graduate students in the private system will account for increasing proportions of administrators (i.e., its really the co-variation between private system and graduate emphasis we are isolating). Therefore, hypothesis 56 can be stated:

56. The relationship of hypothesis 55 will be greater in the private system than in the state system.

Due to the greater emphasis for business and business education in the United States, there may result a greater tendency for "isomorphism" (Riesman, 1958), (i.e., to "keep up with the Jones'") in the United States system. Therefore, in the United States state system, one could expect that the increased emphasis in selecting and accommodating the quality students will reflect cultural differences. Therefore, hypothesis 57 can be stated:

3). The relationship of hypothesis 11 will be greater in the state system than in the Canadian system.

DIFFERENTIATION AND ADMINISTRATIVE STRUCTURE

It will be recalled that differentiation was defined in two ways for this study. It was defined in terms of horizontal functions (specialisms) at the administrative level, officially designated with at least one full-time equivalent performing activity in the specialism. Further, it was defined as those functional specialisms that were derived from the expansions of existing specialisms, in contrast to functions which were "added on" (i.e., added due to some other reason rather than the growth of existing specialisms). Consequently, both dimensions of differentiation will be considered to have different effects on the administrative component. It must also be recalled that the reason for conceptualizing differentiation on these two dimensions was that when specialisms were added due to the internal growth of existing specialisms, the new units became more specialized and, therefore, existing administrative personnel could handle the homogeneous expanded scope of the function.

In contrast, specialisms that were "added on" are more likely to be functionally distinct from existing specialisms (for example, bureau of urban research) and that more often new administrators would have to be recruited to handle the new function. Blau (1970:217) attempted to account for these two effects that structural differentiation had on the administrative component, using the concepts of "intra-unit homogeneity" and "inter-unit heterogeneity."

> The pronounced differentiation of responsibilities in large organizations enhances simultaneous intra-unit homogeneity and inter-unit heterogeneity inasmuch as duties are more differentiated and the amount of work required in most specialties is greater in large organizations than in small ones, there are comparatively many employees performing homogeneous tasks in large organizations. The large homogeneous personnel components in large organizations simplify supervisor and administration. . . and a lower administrative ratio (1.3) in large organizations than in small organizations. Consequently, organizations exhibit an economy of scale in administrative manpower (1.5). At the same time, however, the heterogeneity among organizational components produced by differentiation creates problems of coordination and pressures to expand the administrative personnel to meet their problems. (emphasis added)

Hence, a two-measure conceptualization of complexity would provide an empirical test for Blau's unmeasured effects. The conceptualization could also account for some of the inconsistencies that pervade the literature. For example, Blau (1970), after controlling for size, found complexity to positively relate to proportions of administrators. However, Raphael (1967), in a sample of labour unions, found an inverse relationship. Heydebrand (1973) also found a negative relationship of differentiation in administrative support when technology was non-routine and varied. He reasons that complexity increases the need for increased numbers of specialized professionals, and when both have advanced to sufficiently high levels, the need for bureaucratic coordination is reduced. However, his analysis reduces the role of the administrator to coordinator. Rather, an alternative explanation is that increasing proportions of professionals engender highly professionalized subunits, which can function more independently. Clearly then, if the functional specialisms are homogeneous or professionalized, this could contribute to economies of scale.

However, our view differs in one respect from that of Blau. While he asserts that heterogeneity will cause a need for more administrators to coordinate, the view taken here is that heterogeneity will cause a need for a type of specialist that may not exist in the current organization. Hall (1972:159) has recently summarized these views as the "Blau-Meyer formulation," as contrasted to Pugh et al. (1969), who argue that the increased proportions of administrators perform specialist activities. The views can be reconciled through the taskperson specialization dichotomy. If tasks are routine, increased size will cause increased homogeneity within units (i.e., therefore a saving on administrative overhead) but this will be offset by larger numbers of different homogeneous units (i.e., therefore increasing the administrative overhead).

The Pugh et al. (1969) formulation however, would reflect that (i.e., when size is sufficiently large) larger numbers of diverse services will be performed by administrative specialists (e.g., marketing expert) and this will contribute to administrative overhead. The view taken for this study will follow Pugh et al. (1969). Accordingly, hypotheses 58, 59 and 60 can be stated as:

58. The greater the number of internal support specialisms, the greater the proportion of administrators.
59. The greater the number of innovative specialisms, the greater the proportion of administrators.
60. The relationship (slope) between non-internal growth specialisms and the administrative component will be greater than the relationship (slope) between internal growth specialisms and the proportion of administrators

across all private, state and Canadian samples.

It will be recalled that the type of control variable is conceptualized as a dummy variable and included in a predictive equation (as for internal support specialisms) and accordingly, measures the effect of private and state control when other predictive variables are controlled. There is still reason to believe that even after controlling for private differences in graduate emphasis, size, proportions of full professors, that differences in competition, nature and diversity of funding per se, will account for private-state differences. The Carnegie Commission (1972:167) supports this view:

> . . .that private universities tend to have higher mean costs in all categories of cost represented than public universities, but the difference is narrowed when the averages are based on weighted FTE enrollment . . . .

(i.e., they controlled for differences due to size and proportions of graduate students). This means that differences due to the systems per se (private versus state) still exist even when size and graduate emphasis are controlled. That is, overhead costs will be a direct indicator of structural differences due to the private system per se.[16] Therefore, hypothesis 61 can be stated as:

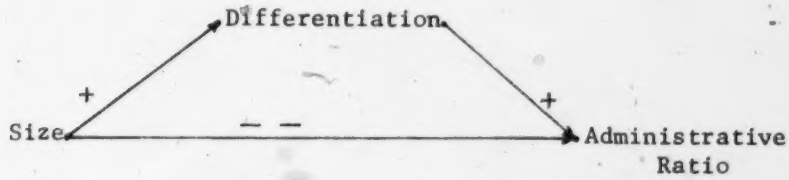
61. Private business schools will have a significantly greater proportion of administrators to faculty, than state schools, even when technology, parent size, submit size, professionalization, internal growth specialisms, and non-internal growth specialisms are controlled

Following the same arguement previously developed for cultural differences, hypothesis 62 can be stated as:

6. State business schools will have a significantly greater proportion of administrators to faculty than Canadian schools, even when technology, parent size, subunit size, professional activity, internal growth specialisms, and non-internal growth specialisms are controlled.

Of particular interest to this study is Blau's (1970:213) finding in employment security agencies of the direct and <u>indirect</u> effects of size (total number of employees) and administrative ratio (total number of supervisors to employee ratio). Using path analysis, he showed a stronger direct negative effect of size on the administrative ratio than the indirect positive effect of size on differentiation (number of occupational specialisms, number of hierarchical levels, number of divisions, and number of sections within branches or divisions) which, in turn, has a positive effect on administration. Schematically, Figure 7 shows this relationship.

<u>FIGURE 7</u>: Size, Differentiation and Administrative Intensity



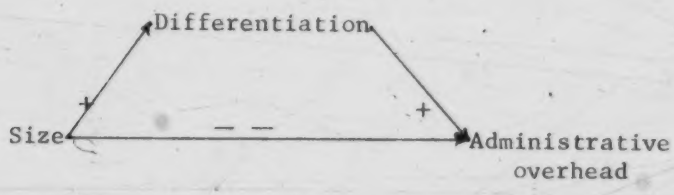
The significance of Blau's (1970) analysis is that it allows us to see the "dual" impact that size has on the administrative ratio. The question is is subunit size really a consequence of technology, task complexity (Heydebrand, 1973:168), age, type of system and parent size?

If so, then when these variables are included in an equation, the effects of size should wash-out. That is, if size is just a consequence of technological or quality decisions then economies of scale due to increased size really reflect decisions, viz. technology. Therefore, the size relationship will wash-out (i.e., making the zero order negative correlation of size in administrative intensity spurious). This is really the issue raised by Child (1973) with Hinnings et al. (1972). The former argues that increasing size allows more diverse services to be offered and therefore any positive zero-order correlation between size and administrative overhead reflects complexity. Hinnings et al. (1972) however, argue that a positive zero-order correlation of size on administrative overhead reflects decisions regarding quality; therefore size and administrative overhead are a consequence of quality; thereby creating a spurious size overhead relationship. In this case with a measure of quality included in the equation would cause size to wash-out. As previously noted, the view for this study is that both "system" and size will both have independent effects on administrative overhead. The issue then is how? It is postulated that the private system and size will both have independent influences but, as previously noted, size must exist in the private system before expanded administrative support can be offered. This implies that controlling for size will wash-out any effect of the private system (i.e., in a routine technology setting). However, the private system also influences graduate emphasis in terms of absolute numbers and quality of those numbers. Therefore quality will have a positive effect on administrative support through these variables. However, as the Carnegie Commission has noted, size does not guarantee

quality; therefore a control for quality may render the size-administrative overhead relationship spurious.

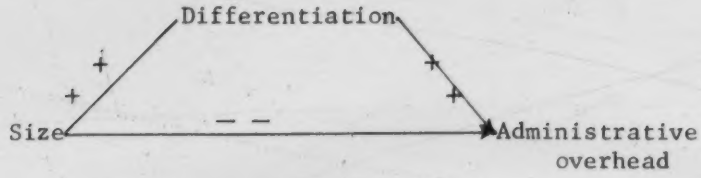
Reconciling both views, size and quality will both exert an independent effect, hence a joint administrative support. However, the degree of the association of size on administrative support will be less in the state system and the strive for economies will be stronger; therefore, the state system could have a stronger negative effect on administrative overhead than the private system, and a less positive impact on complexity. Therefore, the state zero order correlation will probably be negative (Figure 8)

FIGURE 8: State system



However, in the private system economies will not be as great a concern (Gross, 1968). Therefore, the negative effect of size on overhead will be less (as noted with one minus sign in the private system - Figure 9). However, the relationship of size on complexity will have a stronger positive (i.e., as denoted by two positive signs - Figure 9) impact on differentiation and hence administrative overhead (i.e., as compared to the state system). Therefore, I am reasoning that size will still exert its independent effects, but the degree will vary because of the system (private-state).

FIGURE 9: Private system



The Carnegie Commission (1972:37,164) supplements this view in universities:

> There are economies of scale in higher education, but their effects are often muted by other influences which tend to result in rising costs with increasing enrollment.

In other words, are the cumulative positive effects of size on complexity and hence complexity on administrative ratio, greater than the direct negative effect of size alone on the administrative ratio? The Commission subsequently notes:

> But the plotted points are scattered very widely around the fitted line--there is great variation in costs per FTE student even among similar institutions of comparable size. Another way of expressing this point is that the simple negative correlation coefficient between cost per FTE student and FTE enrollment tends to be low, and the standard deviation tends to be high. This is not so much a reflection of little or no relationship between cost per student and enrollment, as of the fact that cost per student is influenced not only by enrollment but by a number of other variables as well. . . . (emphasis added)

In other words, the Carnegie Commission found a low negative relationship between size and FTE costs (i.e., a manifestation of structure) but the effect was muted by the effect of size on other variables such as complexity, technology, and the system (i.e., size will not wash-out). Using multivariate analysis, they conclude:

> As a result of these complex and, to some extent, contradictory influences, we have found that a more significant and consistent inverse relationship between educational costs emerges on the basis of multivariate analysis than on the basis of a simple analysis of the relationship between costs and enrollment. (emphasis added) (They do not show the weights of their regression coefficients.)

Although the Carnegie Commission used educational costs per FTE student, as compared to total number of administrators to faculty ratio in this study, the two are comparable, in that administrative intensity is certainly a major indicator of educational costs. Following the Carnegie Commission (1972, hypotheses 63 and 64 can be stated as:

63. For the state and Canadian systems, the positive indirect effect of size on both dimensions of differentiation and, hence, on the administrative component, will be less than its direct negative effect on administrative component (i.e., the zero order correlation will be negative).
64. For the private system, the positive indirect effect of size on both dimensions of differentiation and, hence, on the administrative component will be greater than its direct negative effect on administrative component (i.e., the zero order correlation will be positive).

SUMMARY

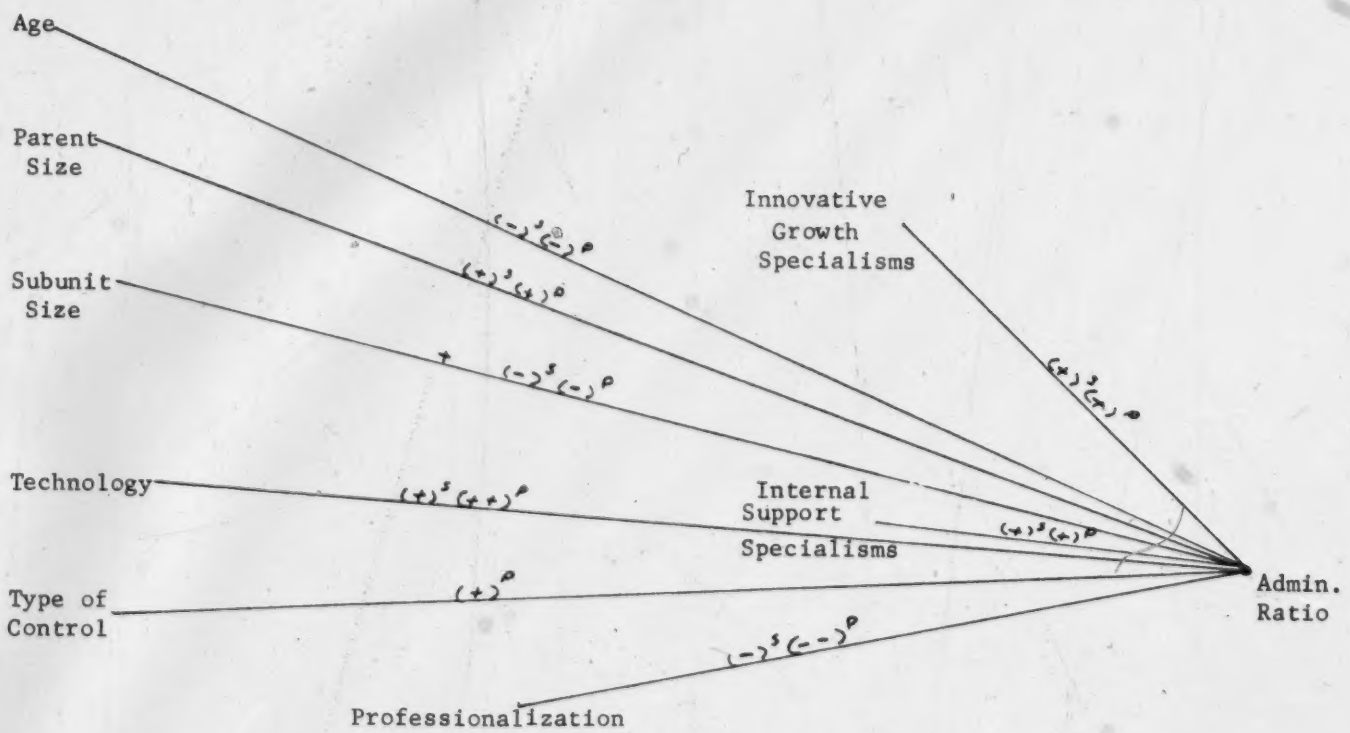
Hypothesis thesis related to administrative ratio are presented in schematic summary form in Figures 10 and 11. Table 1 shows a summary table of the variables used in this study.

TABLE 1

VARIABLES USED IN THIS THESIS

Type of Variable	Use of Variable
a) Contextual variables	
Size (s)	Explanatory
Age (a)	Explanatory
Technology (t)	Explanatory
Parent Size (P.S.)	Explanatory
Professionalization (P.)	Explanatory and Dependent
b) Structural variables	
Internal Support Specialisms (I.S.S.)	Explanatory and Dependent
Innovative Growth Specialisms (I.G.S.)	Explanatory and Dependent
Administrative Ratio (A.R.)	Dependent

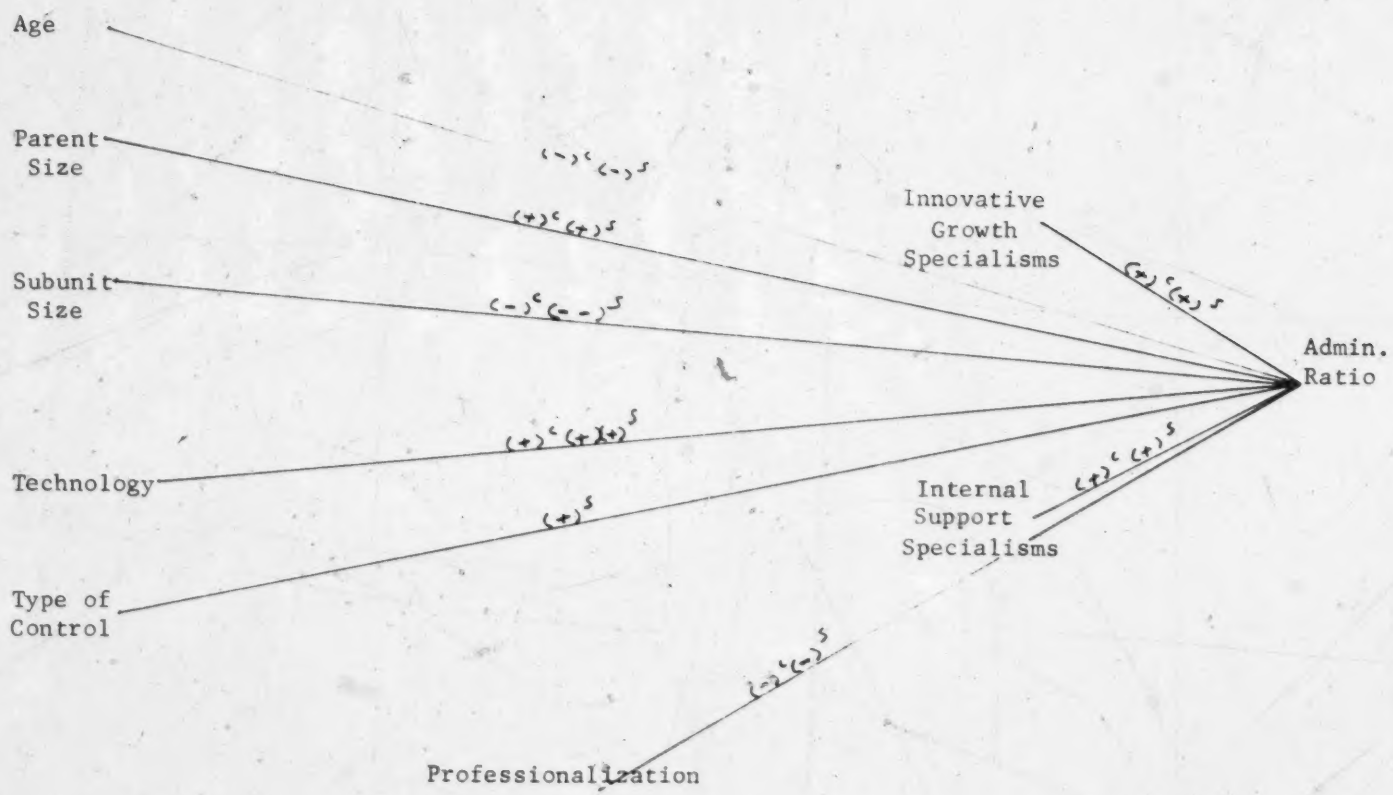
FIGURE 10: A Schematic Summary of all Hypotheses Relating to Administrative Ratio for Private-State Comparisons



( )s = state

( )p = private

FIGURE 11: A Schematic Summary of all Hypotheses Relating to Administrative Ratio For State - Canadian Comparisons.



CHAPTER III

FOOTNOTES

[1]The minus and plus signs can be interpreted as follows. The $(-)^s$, $(-)^p$ refers to the magnitude of this relationship. For example, the signs noted above the age - professional activity vector would mean that the relationship of age to professional activity is hypothesized to be negative for both state and private business schools. The $(--)^s$, $(-)^p$ relationship would denote that the relationship would be hypothesized to be stronger (as denoted by two munus signs) in state schools as compared to private schools.

[2]The same interpretation of signs is to be used for state-Canadian comparisons, except $(-)^c$, $(-)^s$ would denote that the relationships pertain to Canadian and state samples respectively. See footnote 1.

[3]The concepts differentiation, specialization, and complexity, have been used interchangeably, as manifestations of the division of labour. Some of the diverse terms that have been used to indicate differentiation or complexity are, internal differentiation (Barber, 1968), functional differentiation (Meyer, 1968), structural differentiation (Rushing, 1968), functional specialization (Pugh et al., 1963), and role specialization (Pugh et al., 1963).

[4]Clark (1968) defines organic growth as part of growth via the combined-process model. He defines it as growth which occurs outside the established institution. For example, social sciences were established outside the existing British Oxbridge University of London. However, in the American context, Clark refers to organic growth as existing outside established structures. However, when the specialism has established itself, he argues that it can then be added to existing structures via the process of differentiation. Therefore, specialisms occurring by these two processes combined, he terms as specialisms added via the combined-process model.

[5]The Carnegie Commission (1971:121-125) has used a typology to denote five classes of institutions of higher learning in the United States. These include doctoral-granting institutions, comprehensive colleges, Liberal Arts colleges, all two year colleges and institutions and professional schools and other specialized institutions. The business schools in the sample of this thesis reflect the first class of institution; doctoral-granting institutions. That is, the parent institutions offer comprehensive courses with doctoral training.

[6]Recently, much debate in organization theory has focused on the relative importance of size, technology, and complexity in determining structure. Works by Aldrich (1972), Child (1973), Hall (1972), Boland (1969), and Thompson (1967) provide a comprehensive selection of the different views.

[7]One of the most dominant themes of Hall's (1972) book was the importance of simultaneously including technology, complexity, and environmental factors in a predictive equation, so as to ascertain the relative importance of each factor.

[8]See footnotes numbers 1 and 2 of Chapter IV.

[9]Blau et al. (1966), Meyer (1968), Blau (1970), Rushing (1968), and Barber (1968) all focus directly on the process of internal differentiation in explaining the division of labour.

[10]For confirmation of this point, see Gross (1968), Gross and Grambsch (1968:66), and O'Neill (1971:46) (i.e., as cited at the beginning of Part 2 in this chapter).

[11]The same theory for size and internal innovative specialisms relationship will apply to the size and support specialism relationship. That is, size will be hypothesized to have a greater impact than technology but less than professionalization, on both support and innovative growth specialisms. Refer to the theory for hypothesis 30 under Chapter IV, Part 1.

[12]See Footnote 1, Chapter IV.

[13]See Footnote 2, Chapter IV.

[14]Starbuck (1965:501) suggests that Woodward's (1965) term "technological-complexity" is a misnomer in the sense that it connotes "smoothness of production." This thesis distinguishes between technology and complexity. Moreover, non-routine technology will connote the opposite of "smoothness of production." This again reinforces the point that conceptual definitions in organization theory are diverse and often misleading.

[15]The same theory for technology and internal differentiated growth will apply to technology and administrative ratio. Refer to the theory for hypothesis 40 under Chapter IV, Part 2.

[16]The differences between the private and state university systems have been stressed throughout this thesis. See Gross (1968), Gross and Grambsch (1968:66), Gross and Grambsch (1968:48), Carnegie Commission (1972:163-189), Clark (1968), and Hartnett (1971:137-138) for studies stressing the differences between the two types of control.

CHAPTER IV

RESEARCH METHODS

DESIGN AND SAMPLING

Universities are probably the most difficult organizations to study in organization theory. This is due mainly to their vast differences in goals, size, complexity, type of control and technologies. Accordingly, choosing a unit of analysis to study must be based on an *a priori* basis.

Many university studies have used the Parsons and Platt (1968) scheme of stratifying universities into three classes of high, medium and low differentiation. They define differentiation as "the degree to which the subunits within each school have boundaries, interests and functions separate from the other units in the institution." Moreover, they conceptualize differentiation as; "the degree of preoccupation with research activity" and, as described earlier, use a S.I.D. index to measure size, quality and research orientation. There are several reasons why Parsons and Platt's (1968) typology has to be rejected. A critique will highlist some of the inadequacies of the above approach and will serve to justify the comparative micro-organizational framework of this study.

Firstly, the assumptions underlying Parsons and Platt's (1968) scheme. The major theme of their work is to show that academic freedom, university and subunit autonomy are realized through research and graduate emphasis. They reason that these have perpetuated the high quality of the United States educational system and society as a whole.

These assertions do have some validity. However, the question as to how these means (i.e., research and graduate emphasis) have achieved these ends is questionable. They assert that institutions characterized by large size, high quality and high graduate emphasis (aggregated as one measure) necessarily approach an autonomous organization. Moreover, they assume that such universities will be less dependent on external forces, thereby permitting the faculty and administration the freedom to place high priority on the values of cognitive rationality (i.e., the technical basis of one's role). They justify this on the basis that the professional role (in highly differentiated-research universities) is centered mainly on research, and the professional is the only one who can judge the direction of this research. Moreover, through his competence the professor is best able to exercise cognitive rationality because of his non-emotional objectivity (i.e., affecting neutrality) and professional authority. Therefore, such an aggregate of these professionals (i.e., at the department and university level) will be totally decentralized in their decision-making.

The end result is that universities become "partially" insulated or insulated to the degree that they can determine their own priorities in regards to pure research. This latter assumption is based on: a) "common" value system (i.e., based on quality and prestige) of the highly differentiated universities and funding agencies; and b) the diversity of the funding agencies (i.e., such that external pressures cannot be concentrated).

The major criticisms of their scheme are: a) the common value orientation of the funding agencies and the highly differentiated

universities toward allocations of those funds in terms of the scope, nature and content of professional research. That is, due to the mutual respect for science and research, external agencies will grant the highly differentiated universities the freedom to determine research priorities; b) the assumption that there will be no differences between highly differentiated state and private universities in terms of determining priorities for research and degree of graduate emphasis (i.e., state legislatures will give land-grant research universities autonomy in regard to research activities; c) the assumption that the various university departments will be commonly orientated (i.e., value rational commitment) to service ideals and this value congruency will affect a low degree of inter-departmental conflict; d) the same assumption concerning professors' values within departments. That is, the primacy and congruency of professional values will perpetuate common individual goal orientations towards research priorities and academic freedom. Moreover, the logical extensions of this assumption are; 1. total equal decentralization of decision making with the "best" ideas adopted, 2. no power factions between faculty and administration, 3. no power factions between different individuals and/or groups within the department. In short, the whole system has a common value and goal orientation, and that decisions and rewards will be allocated on the most sound, rational and logical alternative. Implicit here is Parsons' assumption that the administrative hierarchy (i.e., through a common rational belief and respect for the professional) will be subordinate to the professional authority. As a consequence, all actors in the system will show "cosmopolitan" values; e) lastly, by viewing the highly differen-

tiated university as an ideal type (i.e., as measured by a "certain" level of quality, research emphasis and size - assuming away any differential forms of control due to state legislatures) necessarily restricts the measurement of such variables within the highly differentiated university system (i.e., therefore their relative importance as contributing to structural variations of the elite universities). Montagna (1968) has stressed the need for better research designs, to account for structural variations in large, highly differentiated organizations. Clearly, the recent work of Hage and Dewar (1973) showed that the values of the power structure of health and welfare agencies were varied and were found to be the most significant variable influencing structure (i.e., thereby showing wide variations in professional values toward change). Moreover, they also showed that wide variations existed as to the content (i.e., proportions of administration and staff) of the decision-making structure.

Further, the contents and values of such groups varied even within the agencies that scored high on measures of decentralized decision-making. This reinforces Wilson's (1967) finding concerning an inverse relationship between innovation proposals and innovation adoptions. In summary, the above analysis clearly points to the importance of distinguishing between values, power structures and decentralized decision-making structures. The three cannot be assumed to vary together based on the a priori assumption of cognitive rationality. It appears that the Parsons and Platt's (1968) associational or collegial model is by and large outdated but may still be applicable to the small liberal arts college where university authority and structures may still follow

the traditional collegial or associational forms. Moreover, the absence of size, varied technology and complexity allowed a closer congruence of values in the traditional "liberal arts college" setting. However, as Clark (1966) very amply shows, the above model must be discarded in multi-university analysis as the nature of the structure, distribution and sources of power have transformed the traditional collegial model of structure and authority into "federations" or "clusters" of heterogeneous units. Unfortunately, Parsons and Platt (1968) generalize their model to encompass all types of universities.[1]

Hall (1972: 41, 30, 31) comments on the utility of such typologies and the need for more encompassing models to include power as a variable:

> . . .we end up knowing only one thing about organizations, not understanding them in such complexity. . . . The essence of the typological effort really lies in the determination of the critical variables for differentiating the phenomena under investigation. . . . The role of power as a component of organization analysis is properly emerging in the literature. Power, including economic power, is clearly an important variable both within the organization and in terms of the organization's transactions with its environment. (emphasis added)

Empirically, research by the Carnegie Commission (1972) and Gross and Grambsch (1963) clearly show that all encompassing a priori assumptions based on cognitive rationality cannot be made for research-graduate orientated and high quality institutions. They show that wide variations exist due to: the effects of private versus state control, varying degrees of distributed power among influencial external and internal university authorities, and varying degrees of consensus, viz. research goal priorities.

The last criticism of the Parsons and Platt (1968) paridigm

concerns the conceptualization and measurement of variables within the model. They combine size, graduate emphasis (i.e., materials technology) which are task complexity variables, with the amounts of grants received per faculty member (i.e., an output measure of performance). However, organization theorists have shown that measures of size and materials technology have independent effects per se on various measures of performance and, therefore should theoretically and conceptually be treated independently, within various forms of environmental control.

More recent studies in universities have not employed recent concepts that have been developed in organization theory. Darkenwald (1971), for example, in a sample of state universities, uses Parsons and Platt's (1968) typology; but extends the meaning of the S.I.D. index from a measure of "functional differentiation" (i.e., degree of subunit autonomy) to a continuum of "institutional professionalization." In this context, he states that the typology also distinguishes categories of universities on a continuum on which the "professional organizations' professionals, not bureaucrats, exercise the line or major decision-making authority related to summary organization objectives. . . ." (emphasis added). In other words, Darkenwald expands the typology from subunit (inter-unit) autonomy to intra-unit professional autonomy. Again the role discretion and decentralized distribution of professional power which is presumed for highly differentiated universities, is confused or equated with the power to implement policy decisions. As previously noted, this is far from the case in highly high quality research and graduate orientated universities (Gross and Grambsch). Clearly, the assumption that professionals in highly differentiated universities

have major authority over major decisions is certainly dubious. To reiterate, the ideal type professional model is an abstracted construct or typology which encompasses attributes of professional associations and the values of their independent professional practitioner. In this context, the ideal model is an abstraction of a different type of professional which exists in the highly differentiated modern multi-university. In this latter case, the professional organization is indeed in an open system, with multiple actors, various power configurations, and various goals. Power differentials are changing, professional power increasingly determined by increasing scarcity and competition for good people, and the professors' ability to attract external funds. These are individual attributes and the power of such individuals will give them an edge in influencing ratios. Therefore power is clustered. Subunits in these universities will have increased power, but they do not receive the power because the university stresses research, and has high quality and, therefore, has to accommodate cognitive rationality by allowing decentralized discretion over one's role in addition to departmental policy.[2]

In contrast, this view asserts that professionals may have the power of discretion over their own role, due to the discretion needed for increasing research activity (i.e., the context of high quality and large size multi-universities). In addition other market forces and ability to attract funds will increase the power of full professors to influence more than the contents of one's role, and these issues which focus on academic freedom are the ones that professors are very sensitive about. As Baldridge (1971) has pointed out, these include

quality of students, peer evaluation, promotion, tenure, recruitment, applied versus basic research, priorities of research versus teaching. Morrison's (1969) recent comment epitomizes the importance of research to professors at Cornell University. He notes that he lost four faculty members because they wanted to pursue only research. Clearly, the battles over the above issues will be hard won, and there will be an increased chance of them being won if a faculty has fifty per cent full professors as compared to one with twenty-five per cent. Therefore, the power to influence policy will not depend on cognitive rationality, in a closed systems context, but rather the ability of individual professors to attract funds and bargain for concessions, and the degree to which this power can be expedited will be a function of the type of control (state versus private, given the highly differentiated context) and the historical development (Johnson, 1972) of the policy of the university. These factors set the parameters or contexts as to how policies will be carried out (i.e., procedures to be followed to the letter-fired rules - or flexible broad guidelines). Therefore, the degree to which power at the faculty level can change or bend those parameters and/or optimize their self interests, viz. academic freedom within those parameters will be a function of: a) the proportion of full professors; b) the degree to which they agree on academic freedom issues. This will depend what specific issues they strive for which is the central focus of the dependent variable in this study.

In summary, the power of faculty to influence policy will be viewed in a multi-variable context, including subunit size, parent size, power structure (inner circle), type of control and technology, all

interacting in an open systems framework. Accordingly, the degree to which such variables predict structure will not be taken to refer to an ideal type professional organization (i.e., as based on traditional practitioner-client relationships) but rather the degree to which context parameters allow professionals to assert their autonomy. Perrow's (1970) recent "descent on technology" suggest such a paradigm in a macro comparative context. Specifically, he reasons that top level organization decision makers will set policy to maximize their own self interests. Accordingly, he reasons that recent trends toward decentralization have been at best limited to increased discretion over one's own role within policy guidelines. Therefore, the degree to which policy (i.e., and hence the parameters which set the content and degree of flexibility of decision making at the subunit level) will in part be a function of the external environment, technology and values of central decision makers. It is clear (Gross and Grambsch, 1968) that the external influences on state and private business schools do vary. For example, it is obvious that the interests of state legislatures are not congruent with the deans or faculty of state business schools. Therefore, of major theoretical interest will be the degree to which the goals of state legislatures influence the policies and hence structures of high quality state business schools, and how these will compare with high quality private business schools. Specifically, the measure of type of control as a dummy variable will serve as one measure of the degree to which structures of state business schools are influenced by goals of state legislatures, with all other variables held constant.

More recent university studies have gotten away from the ideal type framework but have stressed one variable at the exclusion of another. For example, Boland (1971) based his study on size and criticized the "technological" theorists by assuming that technologies in universities are constant. For example, in his quest to determine that size is the most important determinant of university structure, he assumed it necessary to "limit the types of organizations studied to those with similar technologies and substantively similar environments." To assume that technology is constant in universities is to neglect within university variations in technology. The importance of technologies at junior colleges, has been stressed by Clark (1971:474).

> As a consequence of dependency on an unselective-voluntary clientele, (i.e., form of materials technology) such as college will be extensively shaped by characteristics of the multitude. (emphasis added)

Similarly, in multi-universities, Kast and Rosenzweig (1973:563) note:

> The diversity of task performance activities in the university suggests the wide differences in technologies in the various disciplines. (emphasis added)

Clark argues that the form of raw material influences structure while Kast and Rosenzweig argue that the diversity of tasks were different kinds of technologies. Both are examples of increased task complexity. Given the shortcomings of his assumption, Boland (1971) did find that universities with faculty sizes in excess of three hundred members had greater power over curriculum, promotions and recruitment. In addition, Hind (1971:280-282) found in a sample of one hundred faculty members at Stanford University that the perceived power of "evaluations" was largely held by the department head and colleagues. Therefore, Boland's and

and Hind's findings, together with Clark's (1971) assertions viz. faculty power, highlight the importance that a lot of power is delegated to the department level and this should constitute the unit of analysis. The major questions, of course, are how much, on what issues and the distribution of power at the department level (Caplow and Magee, 1958).

In sum, the above analysis points to a sample research design stratified by type of control and absolute size;that is,a faculty with greater than three hundred faculty members at the business school level. The key question remaining, however, is the type of university that should be studied. By level I mean the official orientation of the university in terms of its goals. For example, Parsons and Platt (1968) view level by graduate emphasis and research orientation; then undergraduate high quality schools with a student body trained for higher level graduate and professional training, and then the general liberal arts non-professional orientation, and finally the specific undergraduate vocational and professional schools. The Carnegie Commission typology stratifies by research universities. other doctoral granting universities, comprehensive universities and colleges, liberal arts colleges, and two-year colleges. Since the major focus of this study is to examine the influences of multiple contextual variables on the structure of the university, it was decided to seek those types of universities that were theoretically relevant to the development of the institutional structure as a whole. In this regard, Parsons and Platt (1968) note:

> Those institutions below the top 'look' to the top of their own pyramid for their ideal standards and the total system is pervaded, in varying degrees, by the research-orientated institutions of highest repute. (emphasis added)

If this is the case, then it is theoretically sound to sample by graduate and research orientated universities. That is, if all the universities tend to emulate those of highest quality, then theoretically it makes sense to analyze the determinants of the various elite structures. It should be stressed that this focus on elite does not view the elite universities as ideal typical "professional organizations" (i.e., with the resulting assumptions concerning total decentralization over all major policy matters). In contrast, it views the elite university as the structure which lower status universities attempt to emulate. Therefore, the focus of this research is to isolate and measure those power and structural variables which the ideal professional organization model has hitherto assumed away. Hawley et al. (1965) suggested this approach as a research strategy with the objective of increasing the predictability in university structure variation:

> . . .the drift toward isomorphism among the structures of different kinds of institutions has progressed farther than we are aware.

By institutions he was referring to industrial, service, non-profit types of institutions. Accordingly, the sample chosen for this study consisted of nine United States private (non denominational) and United States state business schools. All schools offer graduate education and are visibly recognized as high quality institutions.[3] The nine Canadian schools reflected nearly the entire sample of Canadian business schools offering graduate education.[4]

Consequently, the research design demanded a purposive sample. It should be stressed that this study is an exploratory study. Mainly for this purpose of isolation and measuring theoretically important

variables which have proved fruitful in studies with samples of non-university complex organizations. Therefore, the results are exclusive to this elite sample only. Accordingly, generalizations to a wider sample of quality or non graduate offering business schools will be theoretical deductions only. As such, statistical tests of significance will apply to these samples only. In noting the importance of exploratory studies and tests of significance, Blalock (1972:528) notes:

> If this is done, (i.e., using a stratified purposive sample) of course, he has no legitimate right to test for the differences among extremes unless he is attempting to generalize to a population made up entirely of such persons. (emphasis added)

Clearly, then, generalizations based on tests of significance will apply to these samples only. The data was collected for the year 1969-70. The sources of data for the study included: catalogues; bulletins; American universities and colleges; The American Universities Fact Book; Commonwealth Universities Handbook; The College Blue Book; Barron's Profiles; American Graduate Schools; the Digest of Educational Statistics; the admissions to graduate study in business (i.e., profile book and fact sheets); personal contacts and letters to some of the institutions.[5]

It should be noted that the nature of the data is structural and therefore has high visibility and is less susceptible to personal bias. The validity of the data of several schools were cross checked with the data in alternative sources of information. The data were correspondingly accurate. Parsons and Platt (1968) raised this question in regards to the validity of the catalogues for their university study. They note:

> The question may be raised as to the validity of the catalogues . . . . Mr. Palley has written to the officials of each institution concerning this issue and, to the extent that the replies received are valid, he received overwhelming confirmation. . . . They are to be taken seriously and are consistently written in cooperation by several administrative officials and faculty members-- persons who are intimately involved in shaping the character of the institution. (emphasis added)

EMPIRICAL METHODS

Pugh and Levy (1969) stress the idea that "a choice of a method of data analysis necessarily implies a choice of a theory of organizational behaviour." It was stated at the outset that the purpose of the thesis had the objectives of; a) comparing across samples means on all variables, b) comparing across samples the slopes of relationships on certain variables, and c) comparing within samples the relative strength of various independent variables. The remaining chapters of this study will be sequentially structured according to the objectives of the thesis.

Several statistical tools were used in this thesis. For comparisons of means, simple t tests were used. For comparisons of hypothesized relationships (e.g., age and support specialisms) across samples, b (unstandardized regression coefficients) values were computed using multiple regression analysis (i.e., ordinary least squares). For comparisons of the relative strengths of variables within samples (for example the relative weight of size as compared to technology on administrative support) standardized beta weights were computed using multiple regression analysis (i.e., ordinary least squares). Path analysis was used to sort out within samples, variables which were

presumed to have direct effects and/or indirect effects on dependent variables (see Appendix A for a technical note on path analysis). Finally, zero order and partial correlations were computed for all relationships to aid in the analysis of spurious effects. For example, both support specialisms and size may be the function of non-routine technology - therefore any relationship between size and support specialisms (as measured by the zero-order correlation) may wash out when technology and size are included in a multiple regression equation on support specialisms. To preserve continuity and better illustrate these statistical techniques, they will be further discussed in the appropriate chapters.

CHAPTER IV

FOOTNOTES

[1]Johnson (1972:9-38) gives a livid critique of the assumptions underlying the "trait" and "functional" approaches to the professional organization. Especially relevant is Johnson's criticisms of Parsons' views of cognitive rationality.

[2]One dominant characteristic consistently emerges from the literature on professional organizations which use the ideal-type as a typology (i.e., or use assumptions of professional behavior in professional organizations). This characteristic is the autonomy of the professional. The problem that continually emerges is that the assumption that a professional will have autonomy based on his level of expertise or the complexity of his occupation, is confused with the power to influence policy. Perrow (1967) has stressed that these are independent political processes. For examples see Darkenwald (1971), Heydebrand (1973) and Heydebrand and Noell (1973).

[3]The structural and perceptual aspects of the concept of quality are very nebulous. For example, in perceptual terms, bias would certainly limit attitudinal measures. For example, Green et al. (1970) asked a sample of M.B.A. students to compare six high quality private business schools. It was noted that perceptually, elite schools whose curricula were perceived as more qualitative had higher prestige ratings (e.g., Harvard, Standord and Wharton) as compared to schools whose curricula were perceived as more quantiative (e.g., Carnegie, Mellon and M.I.T.). Clearly, perceptual bias does confound quality ratings. In terms of structural measures of quality, the Carnegie Commission has noted inconsistent variations in such measures as library holdings and percentage of Ph.Ds. Such inconsistencies reduce the validity of a measurement for the quality concept. Clearly, there are many facets of quality. The real issue is to break the concept down to a more consistent theoretical base. Moreover, as previously noted, the research design of this study has stratified to include only "high quality" business schools. A further rank ordering on qualitative or quantitative bases as noted above, would be dubious.

[4]The University of Toronto and McGill University were excluded from the Canadian sample due to the difficulty in obtaining the data.

[5]See appendix B for the raw data used in this thesis.

CHAPTER V

COMPARISON OF MEANS

Due to the large number of hypotheses, the following "refinement" approach will be used for the results and discussion. Firstly, all hypotheses will be examined in the results. However, some relationships will be much more theoretically relevant than others. Therefore, important and unanticipated findings will be discussed in greater depth in the discussion chapter.

Table 1 summarized the types of variables used in this study. Hypotheses 1, 2, 3, 4, 5, 6, 7, 8, 19, 20, 33, 34, 47 and 48 all predicted differences in means of selected variables across the private, state and Canadian samples. Confidence limits were set up at the .95 level based on the state mean. If private or Canadian variable means were outside this range, then significant differences (i.e., at the .95 level) between the means existed. "t" tests were used for all statistics.

In private-state sample comparisons, the hypothesized differences in mean; parent sizes (1), materials technology (i.e., proportion of graduate students)(3), internal differentiated support specialisms (33), innovative differentiated specialisms (19), and proportion of administrators (47), were all supported. That is, private business schools have significantly smaller institutional sizes, larger proportions of graduate students, greater number of internal support specialisms, greater numbers of innovative specialisms, and greater proportions of administrators. Confirmation is, therefore, given to the theoretical

and empirical studies which postulated differences between private and state universities.

However, some surprising and unanticipated results were revealed. State schools are as equally professionalized (proportion of full professors), with similar faculty sizes. Therefore, hypotheses 6 and 2 are not supported. The belief that state business schools have larger faculties is unsupported. However, this finding could be obscured by the fact that private business schools have significantly larger proportions of graduate students and hence require larger faculty.

In state-Canadian sample comparisons, Table 2 reveals that significant differences exist between parent size (4), faculty size (5), materials technology (7), professionalization (8), internal support specialisms (34), and innovative growth specialisms (20). However, very surprisingly when subunit size is controlled, Canadian business schools have as great a proportion of administrators to faculty size as do state schools, therefore hypothesis 48 is unsupported. This nullifies the notion that American state business schools are better staffed because of higher proportions of non-clerical administrators. There were no reasons to suspect differences in mean ages of Canadian and state business schools. However, Table 2 reveals a significant difference.

The general conclusion for Chapter V is that American private business schools are more bureaucratized (i.e., in terms of administrative overhead) and have greater specialized support and research functions and, therefore, <u>may</u> be more efficient. Increased proportions of administrators may be justified in the private system, given the different constraints (i.e., competition, securing need for autonomy

Variable	Confidence Internal (.025)	State		Private		Canadian	
		$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.
Age	1916.84··· 1926.72	1921.78	17.146	1917.44	24.177	1943.111	15.120
Parent Size	25,446.09··· 32,388.79	28,927.44	12,008.14	11,647.56	4796.16	13,615.66	5,021.88
Subunit Size	68.09···82.35	75.22	24.74	78.89	48.07	36.56	13.19
Professional Activity	37.97···44.26	41.11	10.91	42.78	8.58	25.81	10.97
Technology	143.32···166.66	154.99	40.48	197.17	23.10	128.36	85.25
Non-Internal Differentiated Specialisms	3.35···2.21	2.78	1.99	4.44	3.50	.778	1.20
Internal Growth Differentiated Specialisms	3.23···2.55	2.89	1.17	4.89	4.80	2.00	1.50
Administrative size/ratio	11.90···15.21	13.56	5.58	24.38	9.52	14.42	8.01

TABLE 2: Test of Significant Difference Between Means

and the like). Pondy (1969) takes this view in denoting that certain industries, due to different environmental factors, require proportionately greater numbers of administrators. On the other hand, the difference could be attributed to what Reisman (1958) calls "isomorphic," a tendency for private business schools to "keep up" with other private business schools; justified on the basis of possible fluctuations in "quality deterioration. But this factor is really a manifestation of competition within the private system. In turn, state schools are more bureaucratized than Canadian schools, but have greater proportions of graduate students and professional activity than Canadian schools. Straight differences between means does not reveal much significant information. What is really of prime interest is what factors "cause" business schools to develop their existing structures. In addition, are there differences across private, state and Canadian business schools in terms of the factors that "cause" the development of their structures? Chapter VI will examine these questions.

CHAPTER VI

COMPARISON OF RELATIONSHIPS OF HYPOTHESIZED CONTEXTUAL AND STRUCTURAL VARIABLES

ACROSS SAMPLE COMPARISONS

Tables 3, 4 and 5 give the zero-order correlations for all the contextual and structural variables used in this study, across private, state and Canadian samples. However, as previously noted, simple zero-order correlations often give the "muted" results of several variables interacting (i.e., recall the example of Figure 7 for the variables' size complexity and administrative component). Therefore, to get a complete picture of the contribution of each variable, multiple regression will be used. Blau and Schoenherr (1971:21) note the value of regression analysis:

> Usually, we are not interested in the relationships between two variables but in the relationships of several independent variables to one dependent variable. The question asked is how conditions influence a given factor, or specifically, what the influence of each condition is when all others are held constant. Multiple regression is designed to answer this question. . . . The partial regression coefficient (partial slope) and the partial correlation indicate, in the somewhat different form noted above for their zero-order counterparts, how closely a given independent variable is related to the dependent variable if all other independent variables are controlled.

For problems of multicollinearity (i.e., the intercorrelation of independent variables), we adopted the same criteria as Blau and Schoenherr (1971:24) that any variables correlated more than .82 would not be used in the same equation. None of the independent variables were intercorrelated by this amount.

Across sample comparisons utilize unstandardized regression

	Age	Parent Size	Subunit Size	Technology	Professional Activity	Internal Differen-tiated Growth	Non-Internal Differen-tiated Growth	Administrative Faculty
Age	-	-.152	-.580	.399	-.446	-.318	-.088	-.010
Parent Size		-	.704	-.165	-.424	.352	.544	-.076
Subunit Size			-	-.436	-.145	.721	.618	.014
Technology				-	.538	.177	.341	.789
Professional Activity					-	.271	.160	.681
Internal Differentiated Growth						-	.805	.581
Non-Internal Differentiated Growth							-	.674
Administrative Faculty								-

TABLE 3: Zero Order Correlations for the Private Model

	Age	Parent Size	Subunit Size	Technology	Professional Activity	Internal Differen-tiated Growth	Non-Internal Differen-tiated Growth	Administrative Faculty
Age	-	.269	-.207	-.256	-.338	-.107	-.581	-.074
Parent Size		-	-.428	.213	.642	-.176	-.401	.107
Subunit Size			-	-.007	-.210	.191	.500	-.194
Technology				-	.266	.660	.331	.626
Professional Activity					-	.205	.300	.466
Internal Differentiated Growth						-	.743	.804
Non-Internal Differentiated Growth							-	.522
Administrative Faculty								-

TABLE 4: Zero Order Correlations for the State Model

	Age	Parent Size	Subunit Size	Technology	Professional Activity	Internal Differen-tiated Growth	Non-Internal Differen-tiated Growth	Administrative Faculty
Age	-	-.004	-.111	.008	.010	-.364	.139	-.104
Parent Size		-	.755	-.234	-.546	-.051	-.347	-.644
Subunit Size			-	-.019	-.341	.550	.166	-.066
Technology				-	.281	.450	-.016	.386
Professional Activity					-	.225	.263	.677
Internal Differentiated Growth						-	.485	.682
Non-Internal Differentiated Growth							-	.766
Administrative Faculty								-

TABLE 5: Zero Order Correlations for the Canadian Model

coefficients. These will be referred to in the tables and in discussion as the b values. In contrast, comparisons of variables within samples utilized beta coefficients. In addition, the technique "backward elimination procedure" (Draper and Smith, 1967:167-169) was used when a particular parameter of an independent variable was insignificant. Subsequently, the parameter was dropped, and the equation re-estimated until all parameters were significant. Table 1 gave a summary of the explanatory dependent variables and the dependent variable. These included professionalization, internal support specialisms, and administrative to faculty ratio. These will each be considered.

A. Professionalization

Figures 1 and 2 summarized the hypotheses (9, 10, 11, 12, 13, 14, 15, 16, 17, 18) relating to professionalization. The equation tested is of the form:

1) $P = b0 + b1(A) + b2(P.S.) + b3(s) + b4(t) + e5.$

The parameters b0, b1, b2, b3, and b4 are to be estimated from the data. It was predicted that $b1 > 0$, $b2 > 0$, $b3 > 0$, and $b4 > 0$. b0 is the constant and e5 is the error term. Table 6 summarizes the parametric estimates of professional activity. The t value and probability level give the probability of the relationship occurring by chance. The zero-order and partial correlations are denoted by r and r^1 respectively. The r^2 value is given for each equation and reveals the percentage of the total variation of the dependent variable accounted for by the independent variables. Figures 12, 13 and 14 schematically show the significant relationships for the corresponding private, state, and Canadian samples. The regression coefficients (b's) are written on top of the lines

denoting the relationships. In addition, Figure 15 provides a summary of all the conceptual definitions and empirical measures used in this thesis. An analysis of covariance was conducted using dummy variables in equation 1(a). Dummy variables were used several ways in the analysis of covariance. Firstly, the type of control variable was conceptualized as a dummy variable. Specifically, equation (1), expanded to include the dummy term, is:

$$1(a)P = b0 + b1(A) + n2(P.S.) + b3(s) + b4(t) + D5\ (\text{type of control}) + e6,$$

where D subscript is the dummy variable. A zero was assigned to state schools, a one to private schools for state-private comparisons. Likewise, a zero was assigned to Canadian schools and a one to state schools. This technique provides us with a technique of ascertaining the differences between private and state schools and state-Canadian schools (i.e., to test if significant effects exist between the private-state and state-Canadian systems) <u>while</u> controlling for other contextual variables. Conceptualized in this way, the private-state and state-Canadian dichotomies represent nominal scales. One advantage of performing analyses of covariance with a regression model is that we do <u>not</u> have the restriction of having x values distributed in all the cells. As Blalock (1972:498) puts it:

> The regression model (i.e., as applied to analysis of covariance) does not place any restrictions on the x's in terms of their frequency distributions. . . and the results of such analysis will give us <u>results that are identical</u> to those obtained using covariance analysis. (emphasis added)

The utility of analysis of covariance via the use of dummy variables can best be explained by an example. A straight comparison of means (Table 2) of variables between the private and state and state and

FIGURE 15: Summary of Conceptual Definitions and Empirical Measures

Variable Name	Conceptual Definition	Variable Class	Variable Type	Empirical Measure
Age	The age of the institution (i.e., business school) Starbuck (1965); Pugh *et al*. (1969).	Independent	Continuous	The date of inception of a business school, e.g., 1916.
Parent Size	The size of the parent university of a business school (Child, 1973; Child, 1973b).	Independent	Continuous	The total student enrollment of a university (part time scored as ½).
Subunit Size	The size of the business school (Hawley et al., 1965; Boland, 1969).	Independent	Continuous	The number of full time faculty (assistant, associate and full professor ranks).
Materials Technology	The relative stress a business school places on doctoral education relative to masters and u.g. training (i.e., percentage of doctoral candidates weighted as 3) and similarly masters education (i.e., percentage of masters students weighted as 2) emphasis relative to undergraduate emphasis (i.e., relative meaning that total enrollment was controlled by using it as the denominator). Conceptual importance of this variable has been stressed by Clark (1971), Jencks and Riesman (1969), and Parsons and Platt (1968). The variable has been measured as the relative	Independent	Continuous	$\frac{3\Sigma x}{x+y+z} + \frac{2\Sigma y}{x+y+z} + \frac{1\Sigma z}{x+y+z}$ x = Ph.D student, y = masters student, z = u.g. student. 3,2,1 denote that the index was weighted. Usually, the index is interpreted as the total number of full time Ph.D students times three, divided by total enrollment (expressed as a percent) plus the number of masters students time two, divided by total enrollment, plus the number of

Variable Name	Conceptual Definition	Variable Class	Variable Type	Empirical Measure
Materials Technology (Cont'd)	number of graduate students by Gross and Grambsch (1968), Parsons and Platt (1968) and the Carnegie Commission (1972).			undergraduates times one divided by total enrollment.
Professionalization as a dependent variable	Concepturally, professionalization as a dependent variable measured the reward (rank) structure.	Dependent	Continuous	Number of full professors divided by total faculty size, expressed as a percent.
Professionalization as an independent variable	Professionalization, as an independent variable relating to addition of numbers of administrative support specialisms was conceptualized as a "dominant coalition." That is, they would act as a professional unit regarding the encroachment of administrative specialisms (Bucher, 1970; Baldridge, 1971).	Independent	Continuous	Number of full professors divided by total faculty size, expressed as a percent.
Professionalization as an independent variable	Professionalization, as an independent variable relating to additions of research bureaus was conceptualized as a homogeneous professional social entity which values innovation. Hence larger proportions of full professors would foster increased numbers of bureaus by the resources they attract (Clark, 1971).	Independent	Continuous	Number of full professors divided by total faculty size expressed as a percent.

Variable Name	Conceptual Definition	Variable Class	Variable Type	Empirical Measure
Internal Differentiation: two variables. Innovative growth specialisms	As one indication of the research activity and innovation of a business school (Ben David, 1968; Ben David, 1972).	Dependent	Continuous	Number of independent research bureaus and organic growth (i.e., growth not as function or expansion of existing specialisms) with at least one full time person committed to the specialism.
Internal Support Specialisms	As one indication of the degree to which administrative support specialisms are specialized and hence legitimately formalized (i.e., one measure of the Pugh et al. (1969) criterion of bureaucratization).	Dependent	Continuous	Number of administrative support specialisms with one full-time equivalent person attending to the specialisms. Support specialisms included, for example, admissions, placement, student affairs, library, computer and alumni functions.
Administrative Ratio (Intensity)	As one indication of the relative number of employees in the organization given over to administrative support (Child, 1973; Child, 1973b; Pondy, 1969; Hawley et al. 1965).	Dependent	Continuous	Number of non-clerical administrators, divided by faculty size, expressed as a percent.

Canadian systems may conceal important interaction effects. For example, a significant difference may exist between the means of a dependent variable across samples. Specifically, say state business schools have a significantly higher mean proportion of full professors than Canadian business schools. Superficially, one may conclude that United States business school professors are more productive and, accordingly, get rewarded for it. This would overlook the fact that the reason why United States state schools may have more full professors is due to the fact that their sample of business schools is older and have proportionately more graduate students. In other words, it may not be due to a difference in the two cultures per se, but rather the interaction of the state system on variables related to proportion of full professors. That is, the United States system containing older schools (i.e., interaction between state system and age) and higher percentages of graduate students (i.e., interaction between state system and graduate emphasis) may be the reasons why their system has higher percentages of full professors. However, when the differences between the systems per se is measured by a dummy variable and included as one independent variable in the equation; (i.e., with the dependent variable) the dummy variable will measure the solo effects of systems with all interactions controlled.

In such a case, if the dummy turned out to be insignificant, then it would be clear that the mean differences between the two systems was caused by an interaction effect of the system (e.g., state) and another independent variable (e.g., graduate emphasis) which was also associated with the dependent variable (e.g., proportion of full professors). Therefore, if a previous analysis had concluded (i.e., on

straight t test-differences of the means) that the significant differences between the means was due to the systems per se; then this conclusion would be incorrect.

The second application of dummy variables is to test if significant differences exist between systems (private-state, state-Canadian) on any given independent and dependent variable. For example, is there a greater association between size and professionalization in the private, as compared to the state systems? Stated another way, do significant differences exist between the effects of size on professionalization across private-state, and state-Canadian samples? Tables 10, 11, 12 and 13 summarize the analysis of covariance for the variables professionalization, internal support specialisms, innovative specialisms and administrative ratio. The variables that were shown to be significant when compared across samples (e.g., the slope of parent size and professionalization is significantly different in the private sample as compared to state samples) were shown in the analysis of covariance tables. Equation 1(a) was expanded as follows:

$$1(b)P. = b0 + b1(A) + b2(P.S.) + b3(s) + b4(t) + D1 \text{ (type of control)} + D5(A) + D6(P.S.) + D7(s) + D8(t) + e9.$$

The D's denoted dummy variables to test for significant differences between the slopes across private-state and state-Canadian samples.

The results in Table 9 reveal some very interesting findings. The analysis for this section proceeds on the assumption that decisions regarding promotion and rank are decentralized in large, heterogeneous state universities, state professional schools, and prestigious universities (Boland, 1969; Baldridge, 1973; Bucher, 1970; Hind, 1971).

	PRIVATE						STATE LAND GRANT						CANADIAN					
	Professional Activity						Professional Activity						Professional Activity					
	b	Beta	T Value	Pr	r	r^1	b	Beta	T Value	Pr	r	r^1	b	Beta	T Value	Pr	r	r^1
Age	-.294	-.823	-11.13	.005	-.446	-.961	-.350	-.550	-2.35	.05	-.338	-.478	NS	NS	NS	NS	.010	NS
Parent Size	-.0007	-.418	-6.05	.005	-.424	-.880	.0007	.790	3.67	.01	.642	.654	-.001	-.546	-1.72	.1	.546	-.298
Subunit Size	NS	NS	NS	NS	-.145	NS	NS	NS	NS	NS	-.210	NS	NS	NS	NS	NS	-.341	NS
Technology	.297	.800	10.72	.005	.538	.958	NS	NS	NS	NS	.266	NS	NS	NS	NS	NS	.281	NS
Constant	B0 = 57.05						B0 = 693.27						B0 = 42.05					
R^2 (adjusted)	R^2 = 96.3%						R^2 = 59.1%						R^2 = 19.7%					

B = regression coefficient

Beta = normalized regression coefficient

T Value = statistic

Pr = probability

r = zero order correlation coefficient

r^1 = partial correlation coefficient

TABLE 6. MULTIPLE REGRESSIONS OF INDICATORS OF PROFESSIONAL ACTIVITY BY SAMPLE

Hypothesis 9 was only supported in private and Canadian samples. That is, the finding confirms Harris (1960:37) that the larger the parent size, the greater the reliance on younger faculty (i.e., the fewer the proportion of full professors) for private and state institutions (b = -.0007-private, b = -.001-Canadian). In contrast, the state schools show a positive significant relationship for parent size and the proportion of full professors. That is, elite state business schools are not relying on younger faculty as their institution size grows, but rather are increasing their proportion of full professors (b = .0007). This could possibly be explained by the fact that larger state business schools (for example, University of Michigan, Minnesota) are in larger urban cemters, and hence business departments attract more research contracts and funds. A control for the variable urban size would reveal this. Another interpretation emerges when one examines the nature of the raw data. It appears that business schools' student enrollment in the largest state universities are small relative to the rest of the university. Conversely, the business schools with relatively smaller parent sizes usually have business schools with large student enrollments. This implies that larger state universities are more selective and, therefore, may justify more full professors. This makes sense when one considers Jencks and Riesman's (1968:284) comment that the more selective state universities have "lumped together graduate and undergraduate instruction in the same subjects" so as to conceal high unit cost for expensive qualified graduate instructors. Another reason could be that the largest prestige state universities have relatively fewer four-year and junior colleges and, therefore, the

state university gets relatively larger proportions of the budget. Accordingly, hypothesis 11, which predicted a more pronounced affect of increasing institutional size, and a fewer proportion of full professors at the private business school level, is supported. In fact, analysis of covariance (Table 10) showed that the difference in slopes (i.e., association between the variables parent size and professionalization between private and state and state-Canadian samples was significant at the .995 level. Moreover, the culture argument (i.e., hypothesis 12), which also predicted larger Canadian universities with fewer proportions of Canadian business school full professors (i.e., as compared to the state system) is supported at the .99 level.

Surprisingly, the relationship between subunit size and proportionately fewer professors was unsupported for all institutions. Accordingly, hypothesis 10 is unsupported. Hypothesis 13 was strongly supported in state and private universities, but not in Canadian universities. In fact, age proved to be the most significant variable in predicting professionalization for the private and state samples.

Hypothesis 14 (graduate emphasis and professionalization) was strongly supported in private schools only. Moreover, the slopes were significantly different (i.e., significant at the .005 level for private, while not significant for state schools), thereby supporting hypothesis 15. This confirms Gross' (1968) findings that the greater emphasis on graduate education in private business schools is, indeed, important.

The real significance of these findings can be explained by the functional theory of stratification. Stinchcombe (1963) developed the

PRIVATE-STATE							STATE-CANADIAN						
	PROFESSIONAL ACTIVITY							PROFESSIONAL ACTIVITY					
	B	BETA	T VALUE	Pr	r	r^1		B	BETA	T VALUE	Pr	r	r^1
Age	-.287	-.615	-4.25	.005	-.38	-.58	Age	-3 50	-26.2	-1.90	.05	.59	-.22
Parent Size	.0007	.991	4.74	.005	.20	.63	Parent Size	-.001	-1.07	-1.96	.05	.56	-.23
Technology	.174	1.87	5.32	.005	.14	.68	Type of Control	(Dummy)		1.84	.05		
Type of Control	(Dummy)		NS	NS	NS	NS	Parent Size (test for coefficient diff.)	(Dummy)		2.88	.01		
Parent Size (Dummy) (test for coefficient diff.)			-4.35	.005			Constant	B0 = 42.0					
Constant	B0 = 571.6						R^2 (adjusted)	R^2 = 57.3%					
R^2 (adjusted)	R^2 = 67.7%												

TABLE 10: ANALYSIS OF COVARIANCE (PROFESSIONAL ACTIVITY)

theory to apply to research orientated universities. Applied to a university context, the theory states that the greater a university values research as compared to teaching and research, or just teaching per se, the greater the monetary and symbolic (i.e., rank and salary) rewards will be appropriated to people who contribute relatively more (i.e., are functionally more important and hence are less interchangeable) to the research goals of the university. In a sample of 94 universities ranked by prestige rating (i.e., rank indicated productivity and hence research emphasis), Abrahamson (1972) verified Stinchcombe's theory by showing that the top third ranked (i.e., the prestige rank measure was based on Carter's (1966) study which used a perception measure of people in each discipline) research orientated universities rewarded their full professors correspondingly higher salaries than associate professors; as compared to the reward structure for full professors of the remaining universities which stressed research to a lesser degree. More importantly, he found this effect remained when he recomputed the scores with the top one-third mean salary (i.e., the result was not an artifact of the wealth of the institution).

The data in this study reveal that private elite business schools reward faculty with full professorial ranks on two criterion: a) age and competence; and b) in response to their functional importance per se; that is, in response to increasing proportions of masters and Ph.D students. Put another way, controlling for rank based on competence and length of service; full professors in the private system are also rewarded due to their functional contribution to increasing proportions of masters and Ph.D students; irrespective of length of

service. This probably occurs by bringing in proven competent scholars at the full professor rank to a greater degree than elite state business schools. This may be justifiable to a greater degree in the private system by the greater stress by funding agencies, faculty and administrators on the goal of maintaining (Gross and Grambsch, 1968:48) and improving quality (Jencks and Riesman, 1968:273). It should be noted that within the private sample beta weights are .800 and -.823 for graduate emphasis and age respectively; while within state samples the beta for age was -.550, and insignificant for graduate emphasis. The insignificant finding of graduate emphasis and full professors must reflect policy (budget in state elite system that permanent appointments at the full professor rank are very rare - obviously for cost and precedent reasons, viz. state system goals as set by legislators. The finding means that private elite universities can, to a greater degree, fall back on endowments and research contracts, thereby giving them greater flexibility and more funds per graduate student (Jencks and Riesman, 1968:284). It is for this reason per se (i.e., interaction of the private system and the relative importance of graduate emphasis) that private schools with proportionately more graduate emphasis have more full professors. Therefore, controlling for systems differences in the mean proportion of full professors results in no significant differences between the systems. (Table 10) However, controlling for system sizes, smaller private universities have proportionately more full professors; but this effect accounts for only about one-fifth of variance. It is noteworthy that graduate emphasis, age and institutional size account for 96 per cent of the variance in the private system.

The importance of the fact that rank is distributed to a larger degree by functional stratification is an important factor, as will be noted later. Power accrues to those positions that are "functionally" more important to an organization, thereby fostering the development of a "dominant coalition" (Perrow, 1961), Cyert and March (1963), Thompson (1967), Child (1972b).

In summary, analysis of covariance (Table 10) reveals that differences between the systems per se (i.e., due to the differences in sources of funding and competition) do not account for any differences in the proportion of full professors. Hypothesis 17 is therefore unsupported. This confirms that (in across sample terms) in the elite private university system, rank and rewards are based to a higher degree on the functional theory of stratification. This reinforces the findings of Jencks and Reisman (1968:284) that, due to federal funding, differences in elite private and state university systems will be reduced. However, the stress that differences can still be expected due to the different emphasis of the private system on "raw materials." The implications for the type of students are twofold. In comparing Stanford and the University of California, they claim that both universities will be selective; but because the former has the power of selection in their own hands, they can limit selection to the top one or two per cent of the student population, while the latter has to contend with state judgments of quality and quantity and, therefore, has to select the top ten or twelve per cent. Therefore, ipso facto the elite private system can be expected to have higher proportions of Ph.D students to total graduate

enrollment and higher proportions of Ph.D and masters students to total graduate and undergraduate enrollment. In addition, the quality of these students can be expected to be higher because there are no differences in the mean number of full professors in the two systems. This fact, coupled with the finding that subsystem (absolute size of business schools) size was insignificant in predicting larger proportions of full professors; then it must, as these data reveal, be precisely due to the quality and relative emphasis for higher proportions of Ph.D's and masters students (denoting the functional importance of these students) that cause the major differences (i.e., controlling for differences in parent sizes) in the reward system between private and state business schools.

The preceding analysis has assumed that in research and graduate orientated universities, rewards are based on research and contribution to graduate emphasis. Ben-David stresses (1972:47,80) research and emphasis and graduate school emphasis have been the new hallmark for prestige; superceding both the traditional elite culture and professional or technical training. This is an important point because it should be stressed that the state system until World War II stressed to a greater degree undergraduate "practical" technical curriculum. Therefore, state elite business schools had a later start at stressing quality and graduate emphasis (Jencks and Reisman, 1968:259-268). This could explain why full professor ranks in the elite state business schools are less a function graduate emphasis per se.

In summary, it should be noted that the interaction term of the private system and its emphasis on quality and quantity of graduate

students is today the major factor still distinguishing between the two systems; adding credence to Jencks and Reisman's (1968:270) case. They note, "it is true the results (i.e., between private and state systems) remain different, but the main reason for this seems to be that the two sectors work with rather dissimilar raw material." (emphasis added) This is also consistent with Gross and Grambsch (1968) who found the most vast difference between private and state universities is the former's tendency to stress the goal of training all legally qualified students.

In state-Canadian comparisons, state schools do have significantly (i.e., at the .05 level) more full professors than Canadian schools as measured by adding the dummy variable to the predictive equation (i.e., controlling for the effect of state-Canadian differences independently of the other independent variables). This is an important finding, as differences between the state and Canadian system per se account for mean differences in professionalization, in addition to the differences caused by age and parent size. However, it is noteworthy that only nineteen per cent (R^2 = 19per cent) of the variation of Canadian full professors was accounted for by the independent variables. This contrasts with 59 per cent and 96 per cent in the state and private samples respectively. Hypothesis 18 is therefore confirmed.

B. Innovative Growth Specialisms

Figures 3 and 4 summarized the hypotheses 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34 relating to non-internal differentiated specialisms. The equation tested is of the form:

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B. Innovative Growth Specialisms

Figures 3 and 4 summarized the hypotheses 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34 relating to non-internal differentiated specialisms. The equation tested is of the form:

	PRIVATE						STATE						CANADIAN					
	Non-Internal Differentiated Growth Specialisms						Non-Internal Differentiated Growth Specialisms						Non-Internal Differentiated Growth Specialisms					
	b	Beta	T Value	Pr	r	r^2	b	Beta	T Value	Pr	r	r^1	b	Beta	T Value	Pr	r	r^1
Age	.156	1.08	4.30	.005	-.008	.787	NS	NS	NS	NS	-.581	NS	NS	NS	NS	NS	.139	NS
Parent Size	NS	NS	NS	NS	.544	NS	-.0002	-1.01	-3.40	.01	-.401	-.639	-.0003	-1.10	-2.52	.025	-.347	-.534
Subunit Size	.099	1.36	6.02	.005	.618	.879	NS	NS	NS	NS	.500	NS	.091	.996	2.38	.05	.166	.435
Professional Activity	.342	.833	4.06	.005	.160	.768	.173	.943	3.20	.01	.300	.633	NS	NS	NS	NS	.263	NS
Technology	NS	NS	NS	NS	.341	NS	NS	NS	NS	NS	.301	NS	NS	NS	NS	NS	-.016	NS
Constant	B0 = -317.20						B0 = .514						B0 = 1.04					
R^2 (adjusted)	R^2 (adj.) = 31.1%						R^2 (adj.) = 58.6%						R^2 (adj.) = 29.6%					

TABLE 7. MULTIPLE REGRESSIONS OF INDICATORS OF NON-INTERNAL DIFFERENTIATED GROWTH SPECIALISMS ACROSS SAMPLES.

These factors led to the gradual elimination of undergraduate professional education vis a vis the concurrent development of liberal arts education in the private system. Clearly then, newer private business schools, to survive, had to develop more expansive curricula and high quality research personnel. They, to a lesser degree, could not fall back on huge established funds, thus competition fostered innovation. This finding reflects several factors. First, as Ben-David (1972:47) has stressed, since World War II the importance of research as a source and yardstick for measuring prestige. This is partially the result of the vast amounts of federal funding that has been pumped into prestigious United States universities. Moreover, given that reward system in these elite institutions is based mainly on "research" then the rank of full professor will be indicative of the most prolific scholars who have contributed to research. Abrahamson (1972) found this to be the case in his sample of research orientated universities. In addition, Bucher (1970:30) found that the quality and quantity of space given to a faculty member in a medical school was a function of individual negotiation between the faculty member and the chairman. More important, the degree of success in negotiations depended on the "assessed stature" of the faculty member. Moreover, assessed stature was based mostly on quality of research and ability to think clearly. All these factors support the functional theory of stratification that the most competent research faculty members will have the rank of full professor, and this rank will be rewarded with other rewards such as space for research bureaus.

A research bureau is more than just physical space (Orlans, 1970).

It also involves research contracts and grants. Again, given that rank is based on functional importance, then full professors probably have (i.e., to a larger degree than associate professors) more competence, experience and connections to attain funds. Moreover, it can be assured that the concept research bureau will reflect a valid measure of innovation. Given the scarcity of resources, it can be well assured that the bureaus will be utilized as effectively as possible to produce results (Bucher, 1970). Burton Clark (1966:289) supplements this view:

> The entrepreneurial activity and resources - gaining influence of professors, which extends down to assistant professors in the social as well as the natural sciences, has had remarkable growth since World War II, and the personal autonomy and power thus achieved in relation to others in the university is considerable. (emphasis added)

Finally, Heydebrand and Noell (1973) reason that innovations (i.e., bureaus) enhance a professional's (professor's) prestige and further increase his power. Terry Clark (1968) reasons that "higher level" professors make the entire system more innovative as funds, ideas and autonomy permeate the entire system. All factors considered it is easy to see why elite universities that have more full professors are more innovative (i.e., b = .342 - private, and b = .173 state).

Hypothesis 23 was also strongly supported. United States business schools with higher proportions of full professors will contribute more to research innovations (bureaus) than their state counterparts. Analysis of covariance (i.e., Table 11) reveals the relationship is significant at the .05 level. Again, it should be noted that this difference reflects an interaction between the private system and private full professor to contribute to a greater degree to

PRIVATE-STATE

NON-INTERNAL DIFFERENTIATED GROWTH

	B	BETA	T VALUE	Pr	r	r^1
Age	.156	.532	4.69	.005	.29	.67
Parent Size	-.0002	-.982	-3.12	.005	-.35	-.47
Size	.099	1.81	6.57	.005	.55	.80
Professional Activity	.172	.570	2.93	.01	.22	.44
Type of Control	(Dummy)		-4.75	.005		
Prof. Activity (test for coefficient diff.)	(Dummy)		1.75	.1		
Constant	b0 = .514					
R^2 (adjusted)	R^2 = 76.7%					

STATE-CANADIAN

NON-INTERNAL DIFFERENTIATED GROWTH

	B	BETA	T VALUE	Pr	r	r^1
Parent Size	-.0002	-1.11	-4.64	.005	.12	-.61
Size	.069	.754	2.60	.025	-.46	.33
Professional Activity	.176	2.08	5.30	.005	.58	.67
Type of Control	(Dummy) NS	NS	NS	NS	NS	NS
Constant	b0 = .681					
R^2 (adj.)	R^2 = 68.7%					

TABLE 11: ANALYSIS OF COVARIANCE (NON-INT. DIFF. GROWTH)

research innovations. Again, several factors could cause this. Because elite private schools have fewer environmental pressures. For example, Hartnett (1971) found in a sample of private and state selective universities, that higher proportions of trustees in selective state universities felt that administrators and/or trustees should have the major say in curriculum, tenure and admissions. Gross and Grambsch (1968:79) noted that trustees and regents were perceived by both faculty and administration as being the second most influential group in the power structures of both state and private universities. Moreover, the Carnegie Commission (1972:72) has noted that at least five state legislators have enacted minimum mandatory teaching loads. They (1972:69) show that the mean classroom hours per week is less in private research universities as compared to state universities. It was stated earlier that there is good reason to believe that control in both state and private universities is largely decentralized. We have to distinguish between the control over the content of the budget and the control over promotions, renewals, space, tenure, and recruitment. There is good evidence to believe these latter considerations are decentralized in large (Boland, 1971) private and state heterogeneous (Baldridge, 1973) and prestigious (Hind, 1971) and professional colleges and universities (Bucher, 1970). However, other policy parameters (i.e., the degree of flexibility within budget allocations) is more likely to affect the collective and individual influence of full professors in state universities (Jencks and Reisman). This influence is important to full professors. Shuster (1970:330, 334) found that the two factors which irritated business faculty full professors most were

future potential (88 per cent of the sample selected this item first and administration (50 per cent). Moreover, future potential referred to the "future potential" of their academic assignments. Many left their previous organization and judged their current job largely on the basis of the presence or absence of this factor. This corresponded to his sample of associate professors who reported salary (46 per cent) and administration (46 per cent) as the two most irritable factors. Jencks and Riesman (1968:272) show that limited enrollments in private schools have increased the dollar amount available per student; implying that private schools with higher proportions of full professors may be able to justify more physical space for research bureaus. For example, Gross and Grambsch (1968) found that private universities stressed more opportunity to pursue their own careers (i.e., .535 gamma across private sample, as actually perceived to exist, versus across state sample). The Carnegie Commission (1971:69) found that expenditures for organized research per full time faculty member were greater in private research universities than in state universities.

Finally, given that the reward structure in state universities is a function of time and competence, as compared to time and competence and in response to increasing proportions of graduate students in the private system, it makes sense that the full professor (rank) is based on functional importance over and above promotion via functional importance and age. This reward system may contribute to increased commitment (Stinchcombe, 1963) and effort on the part of full professors in private business schools. On the other hand, it could reflect an elite state power structure which is still partially dominated by full

professors in traditional business core subjects (i.e., accounting and finance). Clearly, the integration of the social sciences and its impact on business curriculum has only occurred in the past few decades.

In summation, the following factors mean that increasing proportions of private full professors have less environmental pressure, heightened commitment, more time, more space, more graduate students, fewer absolute numbers of students, and more opportunity to pursue their careers. Therefore, it is surprising the findings were not more intense (private b = .342, state b= .173). However, the intensity is almost twice as strong.

Table 11 shows the analysis of covariance. The differences across the two systems between the above relationship of schools with increasing proportions of full professors and higher organized research is significant at the .1 level (i.e., .048 off .05 level). It should be noted that this is the interaction of the private system on the relationship of full professors and organized research while <u>controlling</u> for the absolute differences in the means of two systems. To put it more simply, assuming that there were no differences in the absolute mean numbers of bureaus in the private system (i.e., controlling for this factor), private business schools with higher proportions of full professors (i.e., due to the interaction of the private system - e.g., more time, etc.) will still cause increasing proportions of research bureaus. In addition, space and funds are increasing in scarcity in both systems (Chiet, 1971).

To put it still another way, the value of covariance analysis allows one to answer questions like the following. That private business

schools with higher proportions of full professors can create and demand more research bureaus not because of their relative influence, less external pressure, higher commitment and more time than their state counterparts, but rather due to the fact that there is simply more money, more competition, and other such factors inherent in the private system. Clearly, the control for systems differences with the dummy variable allows us to partial out this effect.

A popular converse to the above argument which has frequently been voiced is that differences, viz. organized research across elite private and state systems, have been disappearing because the federal government contributing to most of the funding across prestigious universities in both systems. In other words, the only reason for differences in numbers of research bureaus across private and state samples may be due to the greater freedom, etc. of full professors in private business schools.

On the contrary, many proponents would argue that the difference between the two systems per se, irregardless of higher proportions of full professors and graduate students, parent size or subunit size, will account for increasing proportions of research bureaus. For example, Gross and Grambsch (1968) found that private universities stress the goal of maintaining top quality. Jencks and Reisman (1968), Clark (1968) stress that increased competition for students, research funds and top faculty has made the entire private system more innovative. Table 11 bears this out, the dummy variable denoting type of control is highly significant (.005). Moreover the partial correlation analysis shows a .67 positive association. That is, type of control per se is a very

important variable accounting for the mean difference in the number of bureaus in state as compared to private systems. Hypothesis 31 is, therefore, strongly supported.

Hypothesis 25, relating increased subunit size and research bureau development is supported in private and Canadian samples only (.099-private, .091-Canadian). Ben David's (1968) assertion that sheer subunit size of the department is contributing to the growth of research bureaus is, therefore, partially supported. This is an important finding as it sheds further light on the issue brought up by Child (1973:331). He questioned the findings of Hinnings et al. (1972) in regard to subunit size and diversity of services offered in church organizations. The latter argue that if an organization stresses quality, increasing subunit size will accompany increased diversity. The Carnegie Commission (1972) have also argued that size in itself does not guarantee quality, but size and quality may be necessary to offer expensive programs. In contrast, Child (1973) reasoned that subunit size alone would permit an organization to offer a wide range of services. Although our measure of size is small, it certainly does support Hinnings et al. (1972) but does not necessarily refute Child. A larger subunit size would provide a more reasonable test for Child's case.

Hypothesis 26 of larger parent sizes and proportionately more research bureaus was not supported. In fact, the opposite was found for larger state and Canadian schools. This is surprising in the state context in view of previously noted findings that larger state schools had proportionately larger proportions of full professors. Again, one

must make a distinction between the decision process viz. the allocation of rank and decisions regarding space for bureaus. Salary and promotion matters are usually negotiated within policy parameters by the dean and respective faculty member. However, space in which bureaus are housed would be relatively scarcer, especially in the larger elite state universities. Therefore, relatively less space per department and hence faculty member. Moreover, the policy parameters regarding space are apt to be more "concrete" than for rank.

Hypotheses 27, 28 and 29 were all unsupported. Increasing proportions of graduate students must, therefore, indirectly affect higher numbers of research bureaus through the intervening variable of full professors. Two inferences can be drawn here. Blau and Schoenherr (1971:25) make a distinction between spurious and indirect associations. For example, they reason that given a causal sequence such as z x · u y; if controlling for z does reduce the association between x and y then x and y are <u>both</u> an artifact of z and, therefore, their relationship is spurious. However, if controlling for z does not reduce the association, but controlling for u does, then the relationship between x and y is moderated by the intervening variable u. Therefore x and y are related by an indirect effect. In this study, controlling for type of control (z) did not reduce the association between graduate emphasis (x) and research bureaus (y). However, controlling for increasing proportions of full professors (u) did reduce the association. Therefore, higher proportions of full professors (u) must mediate between materials technology (x) and research bureaus (y). Accordingly, increasing proportions of graduate students have an <u>indirect</u> effect on

research bureaus.

In terms of the relative predictive power of proportions of full professors, size and technology on research bureaus; within sample beta coefficients support hypothesis 30 for the state sample only. That is, of the three variables, only in elite state schools does higher proportions of full professors emerge as the best relative predictor of research bureaus (beta = .943). Subunit size emerges as the better predictor for the private and Canadian samples (i.e., beta = 1.36 state, .996 Canadian).

For the Canadian sample, the finding is consistent with Hall's (1972) view that when technology is routine, size will be an important predictor of structure. For the private sample, the importance of size confirms Hinnings et al. (1972). More specifically, when larger size occurs concurrently with the goal of maintaining and improving quality, it emerges as the most important predictor of numbers of research bureaus. Gross and Grambsch's (1968) finding that state university faculty and administrators both perceived that keeping costs down was an important goal, but the goal of maintaining top quality in all programs was insignificant. Moreover, this goal was insignificant for their private sample, but the goal of maintaining top quality in all programs was highly significant. Their findings lend credence to the aforementioned, Hinnings' et al interpretation of the finding that quality and size must both exist before size emerges as an important variable (i.e., especially when absolute subunit sizes are relatively small). Child (1972) has stressed the relative importance of absolute size as one important contextual variable which may influence how decision makers

may act in designing their organization structures. Clearly, under the rubric of maintaining and improving quality, wide variations can exist in structural patterns (Cyert and March (1963:118-120)). Moreover, given that size was measured as the total departmental faculty size, also reflects Gross and Grambsch's (1968) finding that private universities stress pure research to a significantly greater degree than state universities. Therefore, larger faculties in elite private schools will be correspondingly involved in more research. Finally, the insignficant finding of size in the state sample may be more than a reflection of costs. Given that most state universities are committed by their charter to educate more proportions of students (i.e., as compared to private schools who determine their own enrollment (Jencks and Reisman, 1968:283-285)) implies that larger state faculty sizes by the norm of rationality (i.e., keeping costs down) will correspond to higher enrollments. That is, larger faculty sizes are a manifestation of increasing enrollments. For example, Boland (1969), Hawley et al. (1965) both found correlations in excess of .900, showing the high degree of association between the two. Therefore, the larger the student body, the larger the proportion of faculty that have to be recruited for teaching. Given that state universities have to submit their budgets to state legislatures, it would be relatively more difficult to hire faculty for research purposes alone. Therefore, state schools with larger faculty sizes are committed more to the "numbers game." Jencks and Riesman (1968:284) note:

> Yet perhaps the only real difference between, say, U.C. and Stanford is not that U.C. lets high schools rank students whereas Standard makes its own judgments, but that U.C. is

> still trying in a half-hearted way to deal with the top twelve per cent whereas Stanford works with what it regards as the top one or two per cent. This difference between U.C. and Stanford is and will probably remain characteristic of leading institutions in the two sectors. Public colleges have great difficulty committing substantial resources to any small group or problem, including the academically gifted. They depend on politicians for money, and they therefore constantly play the numbers game, spreading their resources and patronage wide rather than deep. (emphasis added)

In terms of state-Canadian comparisons, the data revealed some very interesting findings. State universities have a significantly greater relationship between professionalization and research bureaus than the Canadian system. This significant difference is revealed in that the association is not significant in the Canadian sample (i.e., the results are obtained from Table 7 where b = .173-state, b = not significant-Canadian). The lack of association between proportions of full professors and research bureaus and programs in the Canadian sample is disturbing.

Schneck (1974) offers one interpretation. Specifically, he reasons that the Canadian institutional structure (i.e., at the macro level) has been much more dependent on the federal government for funding. Correspondingly, the system is less open and, therefore, less innovative.

The "publishing" ethic is less emphasized in Canadian business schools could also account for the lack of association between increasing proportions of full professors and research bureaus. This could mean that many of the full professors are from the traditional accounting and finance core. Generally, these people are less open to innovations, especially if they involve innovative applications from the humanities. The humanities have altered the content of many business school curricula.

Type of control between state and Canadian samples revealed a surprising relationship. The t tests in Table 2 revealed that state business schools have a significantly (.05 level) greater mean number of research bureaus than Canadian business schools. However, when subunit size, technology, parent size, age, and proportion of full professors are controlled, with type of culture entered as a variable in the equation (Table 11), the latter turns out to be insignificant. This means that the cultural variable must be interacting with one of the independent variables to produce the difference in the number of research bureaus. That is, vast amounts of United States federal funds must cause state schools with higher proportions of full professors to compete for federal funds with subsequent increases i research bureaus. This could cause the difference in the number of .e arch bureaus in state as compared to Canadian universities. Clearly, the data reveals that it is not the cultural variable (i.e., state-Canadian) per se, that accounts for the difference in numbers of research bureaus. This is another good example of why analysis of covariance was chosen with type of control as a dummy variable. Clearly, just a straight comparison of means of the number of research bureaus across state and Canadian samples, would have led one to the conclusion that the differences (.05 level) were due to differences in the two systems. This would have been an erroneous conclusion.

C. Internal Support Specialisms

Figures 5 and 6 summarized the hypotheses 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46 relating to internal growth differentiation.

The following equation was tested:

3) ISS = b0 + b1(A) + b2(P.S.) + b3(s) + b4(t) + b5(P) + e6.

Table 8 summarizes the results of the equations and figures 12, 13 and 14 schematically show the significant relationship for the corresponding private, state, and Canadian samples.

Hypothesis 35 was unsupported (Table 8) for private and Canadian schools. Older business schools do not have greater numbers of support functions (i.e., admissions, placement). On the contrary, the data (for state sample only) reveal (.025 level) that newer business schools have greater internal support specialisms. That is, controlling for increasing proportions of full professors, newer state schools would have relatively fewer inbred administrative practices and, therefore, higher tendencies to turn these practices over to administrative specialists.

Hypothesis 57 was unsupported (Table 8). Apparently, the degree of internal differentiation at the business school level does not increase with the increasing parent size of the institution. In contrast, significant negative (.005, .01, .005 levels) relationships were found across private, state, and Canadian samples. The relationships (-.0008, -.0001, -.0003) were consistently negative and highly significant. These findings are contrary to our theoretical expectations. For example, other researchers have found that as the parent size (Boland, 1971) of state universities increases, so does the tendency to decentralize decision making. Moreover Scott and El Assel (1969) and Baldridge (1973) found that when parent size and complexity increase, so does the focus of control turn over to the departments. However,

	PRIVATE						STATE						CANADIAN					
	Internal Differentiated Growth Specialisms						Internal Differentiated Growth Specialisms						Internal Differentiated Growth Specialisms					
	b	Beta	T Value	Pr	r	r^1	b	Beta	T Value	Pr	r	r^1	b	Beta	T Value	Pr	r	r^1
Age	NS	NS	NS	NS	-.318	NS	.054	.800	3.53	.025	-.107	.757	NS	NS	NS	NS	-.364	NS
Parent Size	-.0008	-.771	-4.83	.005	.352	-.853	-.0001	-1.25	-4.55	.01	-.176	-.838	-.0003	-1.08	-3.95	.005	-.051	-.723
Subunit Size	.162	1.62	10.05	.005	.721	.962	NS	NS	NS	NS	.191	NS	.155	1.38	4.99	.005	.550	.806
Professional Activity	-.179	-.320	-2.42	.05	.271	-.594	.112	1.05	3.85	.01	.205	.788	NS	NS	NS	NS	.225	NS
Technology	.193	.928	7.00	.005	.177	.925	.024	.851	5.19	.005	.660	.871	NS	NS	NS	NS	.450	NS
Constant	B0 = 29.48						B0 = -106.59						B0 = .724					
R^2 (adjusted)	R^2(adj.) = 95.0%						R^2(adj.) = 81.9%						R^2(adj.) = 74.2%					

TABLE 8. MULTIPLE REGRESSIONS OF INDICATORS OF INTERNAL DIFFERENTIATED GROWTH SPECIALISMS ACROSS SAMPLES.

the findings do not refute their interpretations. Rather, decisions no doubt are turned over to the departments, but budget constraints must limit the degree to which these specialisms can be housed by individual specialists at the department level (Carnegie Commission, 1972:167). Clearly, size does create complexity and increasing complexity (i.e., complexity usually defined as the number of different facilities and needed services at various subunit levels, e.g., medicine, law and dentistry) creates diversity that is not amenable to economies of scale. Therefore, Pondy (1969) argues that budget considerations must predominate. That is, it simply is too expensive at higher levels of complexity to add additional specialists at the subunit level.

The analysis of covariance reveals that there was a significantly (.005 level) greater tendency for private business schools with larger parent sizes to have fewer internal support specialisms at the school level, as compared to state business schools (Table 12).

In the comparison of the magnitude of the slopes (Table 12) of increasing private and state university parent sizes with decreasing numbers of support specialisms (b = -.0008 - private, -.0001 - state) one important factor must be considered. Specifically, as the absolute parent size of state universities increases beyond a certain point (i.e., approximately 37,000 students) the rate at which incremental support specialisms decreases at a decreasing rate. Moreover, the relationship is curvilinear, that is, beyond a certain state parent size, business schools still need a minimum number of support specialisms. Therefore, the differences in degree of the magnitude of the private and

PRIVATE-STATE

INTERNAL DIFFERENTIATED GROWTH

	B	BETA	T VALUE	Pr	r	r^1
Age	.054	.152	2.09	.05	-.29	.35
Parent Size	-.0001	-.439	-2.69	.025	-.15	-.47
Size	.162	2.41	12.91	.005	.65	.95
Professional Activity	.112	.302	2.27	.025	.22	.39
Technology	.024	.267	3.07	.01	.34	.54
Parent Size (test for coefficient diff.)	(Dummy)		-4.92	.005		
Prof. Activity (test for coefficient diff.)	(Dummy)		-3.84	.005		
Technology (test for coefficient diff.)	(Dummy)		7.36	.005		

STATE-CANADIAN

INTERNAL DIFFERENTIATED GROWTH

	B	BETA	T VALUE	Pr	r	r^1
Age	.054	38.9	2.62	.025	.33	.41
Parent Size	-.0003	-2.79	-4.51	.005	.14	-.67
Size	.155	2.35	5.69	.005	-.12	.76
Professional Activity	.112	1.82	2.86	.01	.35	.45
Technology	.024	1.50	3.85	.005	.44	.60
Type of Control	(Dummy)		-2.64	.025		
Parent Size (test for coefficient diff.)	(Dummy)		2.53	.025		
Constant	b0 = .72					

(continued)

(continued)

PRIVATE-STATE						STATE-CANADIAN					
INTERNAL DIFFERENTIATED GROWTH						INTERNAL DIFFERENTIATED GROWTH					
	B	BETA	T VALUE	Pr	r	r^1		B	BETA	T VALUE	Pr	r	r^1
Type of Control		(Dummy)	1.51	.1			R^2 (adjusted)		R^2 = 76.6%				
R^2 (adjusted)		R^2 = 94.9%											

TABLE 12: ANALYSIS OF COVARIANCE (INTERNAL DIFFERENTIATED GROWTH)

state slopes (-.0008, -.0001) is not necessarily a manifestation of differences in the two systems per se, but rather reflects a "muted" measure of association in the state system due to absolute differences in system sizes (i.e., several state universities with sizes in excess of thirty thousand students). Therefore, it cannot be postulated within private business schools samples that the variable increasing parent size contributes to any fewer (-.0008) mean numbers of administrative support specialisms as when compared to the weaker (b = -.0001) within state schools association (i.e., increasing state parent size as contributing to a lesser degree - that is, the difference in magnitudes between -.0001 as compared to -.0008, to the mean number of administrative specialisms within the sample of state business schools).

In comparing state and Canadian university parent sizes and decreasing numbers of administrative support specialisms at the business school level, yields the expected result. That is, when controlling for differences in mean numbers of support specialisms in a combined across state and Canadian samples, the parent size dummy variable of Table 12 reveals that as the parent size variable increases within Canadian business schools, it contributes to a significantly lesser degree (i.e., .005) to the mean number of Canadian administrative support specialisms than does state parent sizes, viz. state administrative support specialisms. However, these differences in slopes could be the result of the absolute differences in parent sizes (i.e., state mean - 28,927.44, Canadian mean - 13, 615.66).

Hypothesis 37 was supported for private (Table 8) and Canadian samples, at the .005 levels. That is, the larger size of the faculty

does determine the need for specializing certain internal differentiated functions (i.e., specializing admissions, placement functions, and the like). However, in state complex, the relationship does not hold. A possible explanation can be found when one considers materials technology. Hall (1977:133) states that the size-complexity relationship would not hold when technology is "hard," around standardized products and services." That is, the higher proportion of graduate students implies more [illegible] instruction, and therefore functions like admissions and placement cannot be handled routinely. Therefore, increased numbers of specialists would be added in response to technology (Thompson, 1967) and not size. [illegible] size will [illegible] (Blau, 1970:[illegible]). However, the [illegible] in the state system [illegible] may also indicate that at the [illegible] level, size may not be sufficiently large to justify [illegible] of administrative capacity. Therefore, size [illegible] [illegible] (Blau, 1970). However, the [illegible] finding in the [illegible] sector suggests that materials technology is largely undergraduate [illegible]. Therefore, specialists can be added to expedite [illegible] when the volume [illegible]. Therefore, in the "mass college" [illegible] students [illegible] through the [illegible] (Blau, 1973:[illegible]) [illegible]. The [illegible] finding [illegible] which was the [illegible] [illegible] of [illegible] specialists [illegible] of the [illegible] of [illegible] quality in [illegible]. This is consistent with the Carnegie Commission's (1973) and [illegible] et al. (1974) view that quality and [illegible] with [illegible] in additions of specialists. The finding is also consistent with Gross and Grambsch (1968) findings that the private universities significantly emphasize the goal of "maintaining top quality"

at the expense of "keeping costs down."

Hypothesis 19 was strongly supported for private institutions only (at the .01 level). That is, the greater the proportion of full professors, the fewer the numbers of support specialisms. This confirms [illegible] (1979: 84), [illegible] (1974), [illegible] (1968:43), and Scott ([illegible]) that professionals will be in conflict and hence resist the encroachment of administrative specialisms.

In contrast, however, increasing proportions of full professors proved to be the strongest predictors of increased differentiated growth specialisms in state institutions. This was a most unexpected finding and will be discussed at length in the discussion chapter. Therefore, private business schools do have a significantly smaller number of these administrative specialisms than state schools, but these differences must be attributable to other factors [illegible]. The analysis of covariance (Table 12) indicated that the proportion of full professors [illegible] differentiated growth specialisms are not [illegible] significant at the [illegible] level, thereby confirming Hypothesis 19.

Hypothesis 20 was strongly supported for state and private schools (.001 level). Increasing the proportion of graduate students does have a significant impact on internal differentiation. In other words, more graduate students require more "personalized" attention. Therefore, the need for more admissions, placement functions, separate offices for MBA programs, Ph.D programs, and the like. This supports Thompson (1967), and the Carnegie Commission (1973). Analysis of covariance

(Table 13) shows that hypothesis 11 is strongly supported (.001 level). That is, due to the increased emphasis on graduate training, concern for selecting the most qualified students (Beta [illegible]) maintaining quality (Beta [illegible]), and increased competition in the private system, higher proportions of graduate students have a much stronger association with administrative support functions (r = [illegible]) for the private system than the state system (r = [illegible]).

Hypothesis 12 was also strongly supported. Higher proportions of graduate students had a stronger relationship to administrative support functions in state schools as compared to Canadian schools in the competition set of the Canadian sample. The reason for this could be the lack of Ph.D. programs in the Canadian system. That is, Ph.D. programs [illegible] disproportionately more in support functions than masters students and undergraduates.

The analysis of covariance with the dummy variables (type of control, [illegible]) yielded some interesting results (Table 13). Controlling for the effects of the independent variables (for example, the differences in state and private campuses in graduate emphasis, professional programs, size, centralization, age), the effect on the mean number of administrative support functions due to private and state control per se was insignificant. Stated another way, differences in administrative support functions cannot be attributed to differences in the private and state systems irrespective of the greater influence in private systems on graduate education, and other variables (i.e., as they also individually affect the support functions).

Hypothesis 13 is, therefore, unsupported. This also confirms Ivey and Crambach's (1968) and Jencks and Riesman's (1968) view that the "raw materials" or emphasis on selecting the most qualified students, is the interaction factor and not the private system per se as it was controlled and turned out to be not significant in [illegible] the major factor distinguishing the two systems. Therefore, Riesman's (1958) "isomorphic effect" a tendency for private schools to "keep up" with their private counterparts, for reasons of prestige and ratings, is not supported. Hypothesis 14 is, however, supported at the [illegible] level. Differences in the state and Canadian systems still account for differences in the number of internal differentiated growth specialisms. That is, consumption of differences in size, proportions of full professors, graduate students, age, and parent size. There is a critical factor in the state system that still accounts for differences in administrative support functions. This could reflect differences in competition in the state system.

Hypothesis 15 was supported for private and Canadian samples (Figures 14, 15). That is, size is a better predictor of internal differentiated growth specialisms (for example, admissions, placement, and the [illegible] than non-internal differentiated growth specialisms (because of better research). Size was insignificant as a predictor for both internal and non-internal differentiation in the state sample. This means that for the Canadian and private sample, that size of the faculty is an important variable in determining both administrative support functions and research bureaus. However, size as predicted is more important in determining the internal specialisms than innovative

specialisms.

Hypothesis 11, which predicted size to be the strongest *within* sample determinant of internal support specialisms, is supported. For private (beta = 1.821) and Canadian samples (beta = 1.181), size emerged as the strongest predictor. Explanations for these findings have been noted under hypothesis 11. In state samples, full professors emerged as the strongest predictor for support specialism growth. Technology rated as the second best predictor (beta = .628 and beta = .851) in private and state samples respectively. However, in Canadian samples, due to the large relative numbers of undergraduates, technology turned out to be non significant.

In summary, size (N = .192) was the strongest predictor of internal differentiated growth in private samples, professionalization for state samples (N = .112), while size for Canadian samples (N = .133) in terms of R^2 (i.e., the percentage of variation of the dependent variable accounted for by the independent variable), a remarkably high (i.e., 49 per cent, 81.8 per cent, 74.2 per cent) per cent of the variation of internal differentiated growth specialisms was accounted for by the independent variables across the private, state and Canadian samples respectively. Surprisingly, some of the independent variables that have been found to be significant in predicting complexity, across organizations, were found to be insignificant in this analysis (for example, submit size in state schools). However, some of the effects of the respective independent variables may have strong indirect effects (i.e., they relate strongly to variables that directly affect complexity. These indirect effects are revealed when path analysis is performed on

[illegible]

tend to be more decentralized (i.e., using proportions of administrators at the subunit level as a measure of decentralization) is unsupported. This does not negate the fact that decisions may be decentralized.

Hypothesis [illegible] was unsupported for all samples (Table [illegible]). That is, as the proportionate number of full professors increases, the relative number of administrators does not decrease or increase for private and state samples. These finding were quite different from the negative finding in the private sample, i.e., increasing proportions of full professors with decreasing numbers of administrative specialists and the positive state finding on these variables. It must be recalled that the administrative measure in this chapter is a relative administrative-faculty ratio. In this context the ratio measures economies of scale. Therefore, the lack of any association in the state and private samples is understandable. This means that the indicators of support and innovative specialists really constitute part of the administrative ratio variable. This means that support and innovative specialists and administrative ratio are statements with different [illegible] that are part of the same variable. Therefore, [illegible] [illegible] [illegible]. [illegible] ([illegible]) [illegible] in explaining this argument. In the [illegible] sample, the [illegible] administrators increased with increasing proportions of full professors and [illegible] [illegible] Hypothesis [illegible]. This finding [illegible] [illegible] and [illegible]. This [illegible] is discussed in [illegible] in the [illegible] chapter.

Surprisingly, hypotheses 15, 16 and 17 are also unsupported for all three samples (technology on administrative intensity)(Table 8). However, the zero-order correlations are large ([illegible]-private, [illegible]-state, [illegible]-Canadian), implying that technology must have a strong indirect effect on administrative intensity through the intervening variables of innovative and support specialisms. Again, this analysis will be discussed in the last section. Hypothesis 17 is supported by zero-order correlations only, that is, graduate emphasis in private business schools ([illegible]-private, as compared to [illegible] for state). However, the [illegible] values are insignificant.

Hypothesis 18 (internal support specialisms on administrative intensity) was very strongly supported for private and Canadian samples ([illegible], [illegible] levels)(Table 8). Therefore, internal growth differentiation is an important variable in predicting administrative intensity ([illegible]-private, [illegible]-Canadian). Therefore, the Carnegie Commission ([illegible]) was quite correct in its assertion that complexity counteracts tendencies for economies of scale in large institutions. However, the finding was insignificant for state schools. In addition, hypothesis 19 (Table 8) is strongly supported across private, state and Canadian samples ([illegible], [illegible], [illegible]). That is, innovative specialisms do contribute very heavily to administrative overhead.

Hypothesis 20 predicted that innovative specialisms would contribute more heavily to administrative overhead (than support specialisms) due to the fact that administrators for these specialisms are have to be externally recruited and that administrators of existing specialisms would not have the managerial expertise to direct a function such as a

FIGURE 12: Private Model (B values for inter-school comparisons)

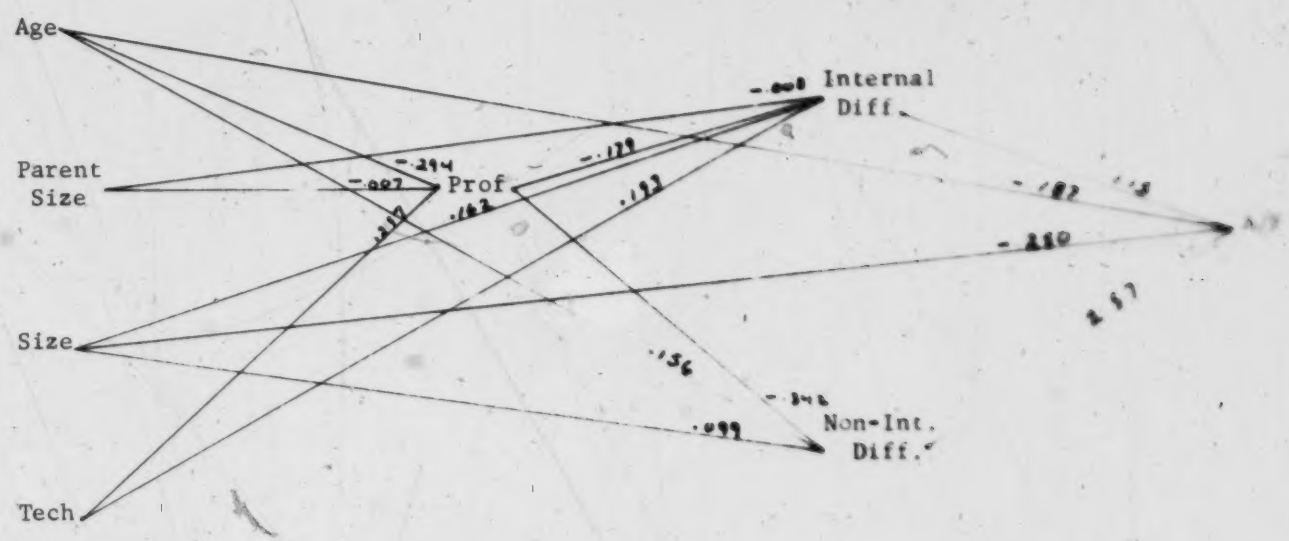


FIGURE 13: State Model (B values for inter-school comparison purposes)

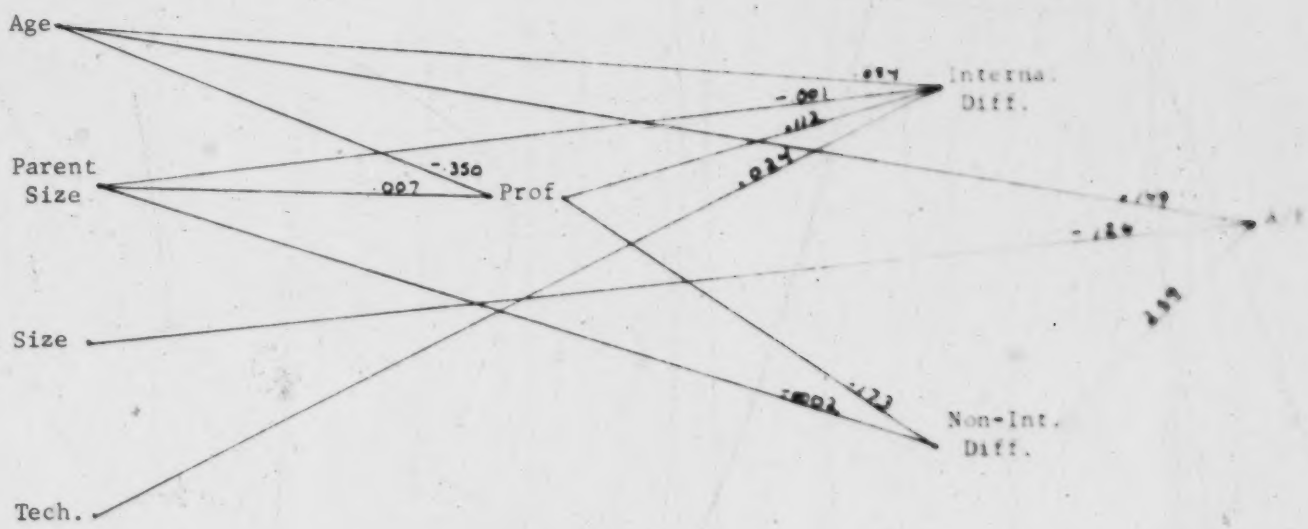
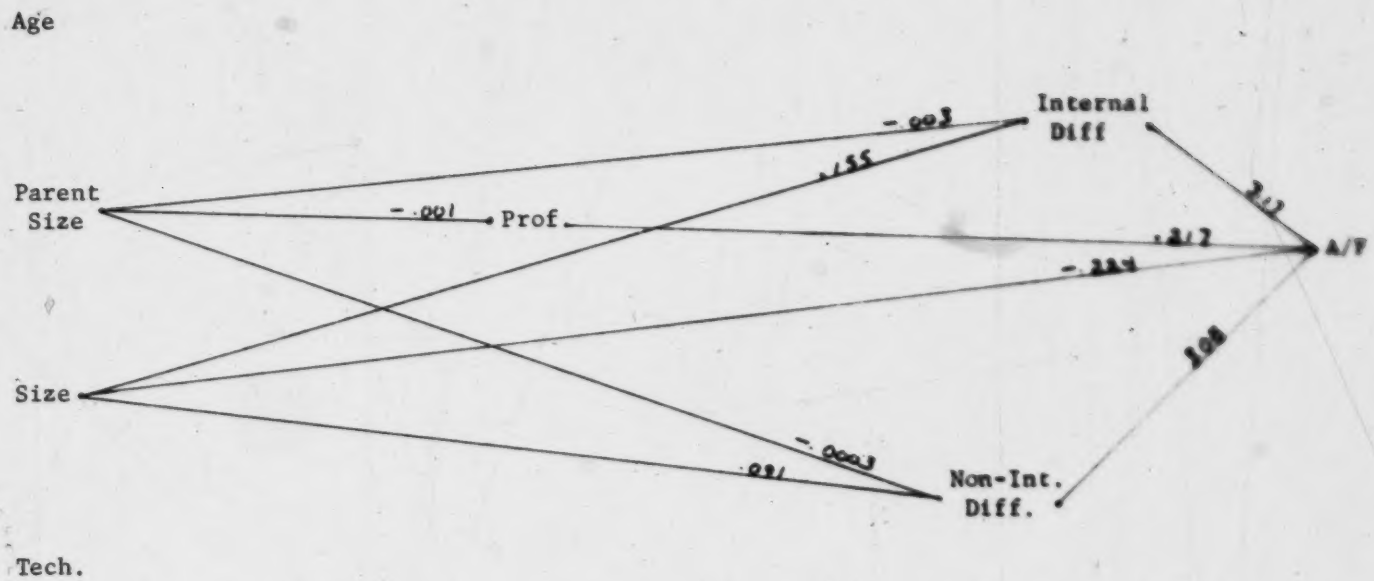


FIGURE 14: Canadian Model (B values for inter-school comparison purposes)



a straight analysis of the absolute means. The conclusion is that Canadian schools are more bureaucratized (at the .05 level) than United States state schools.

In summary, innovative specialisms proved to be the major factor contributing to administrative overhead across samples. Adjusted R^2 statistics (Table 9) show that the independent variables accounted for 92 per cent, 66 per cent, and 97 per cent of the variation of the administrative ratio in private, state, and Canadian samples respectively. The Carnegie Commission (1972) notes that care should be taken when analysing administrative overhead factors. Pondy (1969) stressed a necessity for professional support functions in the effective attainment of administrative functions, but cautions that these functions should only be added as long as "the marginal productivity of administrative personnel also increases and it, therefore, becomes more profitable at the margin to employ administrators." The last section of this chapter will focus on analyzing direct and indirect effects using path analysis.

WITHIN SAMPLE COMPARISONS: PATH ANALYSIS

It was shown in the last section that some independent variables have strong indirect effects on dependent variables. For example, the indirect effects of professional activity and technology can be shown by their strong zero-order correlations with administrative ratio; but their direct effects (beta values) in a multiple regression equation are insignificant. This implied that both indicators of complexity were strong intervening variables. See Appendix B for a discussion of Path

Analyses. This implied that both indicators of complexity were strong intervening variables between professional activity, technology, and administrative ratios. The technique of path analysis helps overcome this dilemma by yielding direct and indirect effects. Moreover, the fact that path analysis forces one to state all of the assumptions, makes a more stringent test of the model. As such, the approach of exacting each hypothesis from a wide body of theory helped us avoid the pitfalls stressed by Hilton (1972) and Heise (1969)--"One major pitfall of path analysis is that the validity of the model depends on the theory used." Clearly, organization structure variables are interrelated and complex. Path analysis allows us to sort out direct and indirect effects which often conceal zero-order correlations. Blau and Schoenherr (1971:24) supplement this view:

> . . .the inquiry is typically conceptualized as asking, for example, how the influence of size on supervision is mediated by those other conditions, and whereas, the answer to this question can be derived from a path diagram, the relative influence of several intervening variables is more easily seen if specific values for each indirect effect are directly presented. (emphasis added)

Three path models are schematically presented in Figures 16, 17 and 18. The beta weights are placed on the path vectors connecting the variables. Table 1 gave a summary of the types of variables used (i.e., age, parent size, size, and technology-explanatory, professional activity, internal differentiated growth, non-internal differentiated growth-explanatory and dependent, and administrative to faculty ratio-dependent). In contrast to across sample comparisons, which utilize unstandardized regression coefficients, path analysis utilizes normalized regression coefficients (beta weights). These weights are

FIGURE 16: Private Model (Beta values for intra-school comparisons)

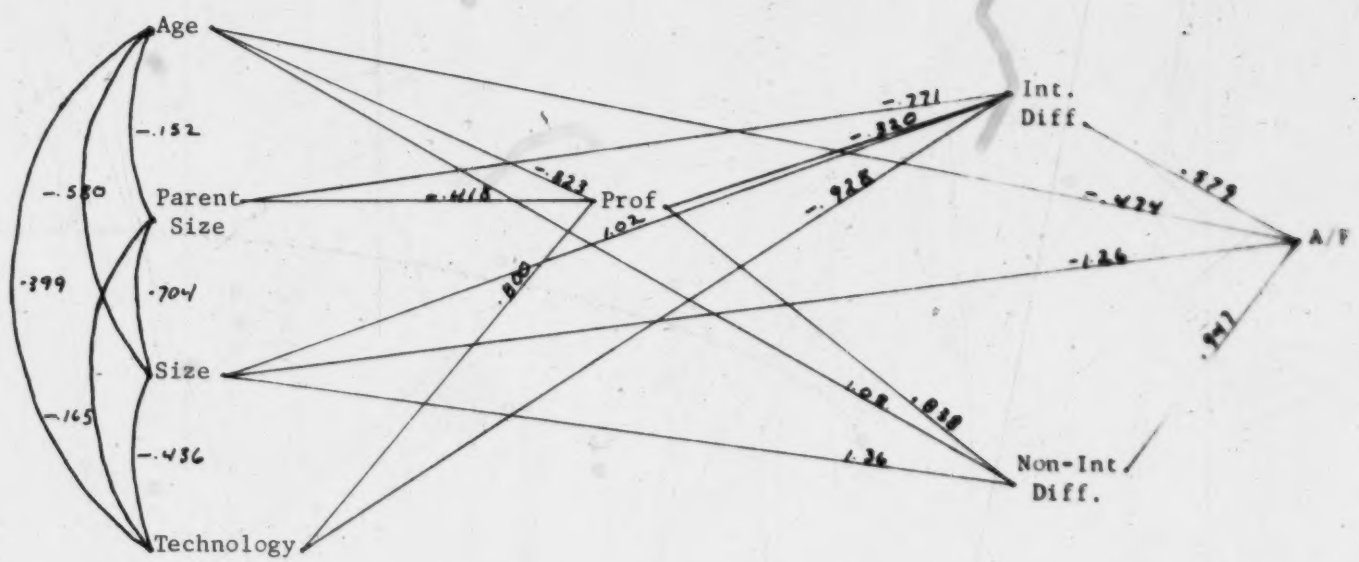


FIGURE 17: State Model (Beta values for intra-school comparisons)

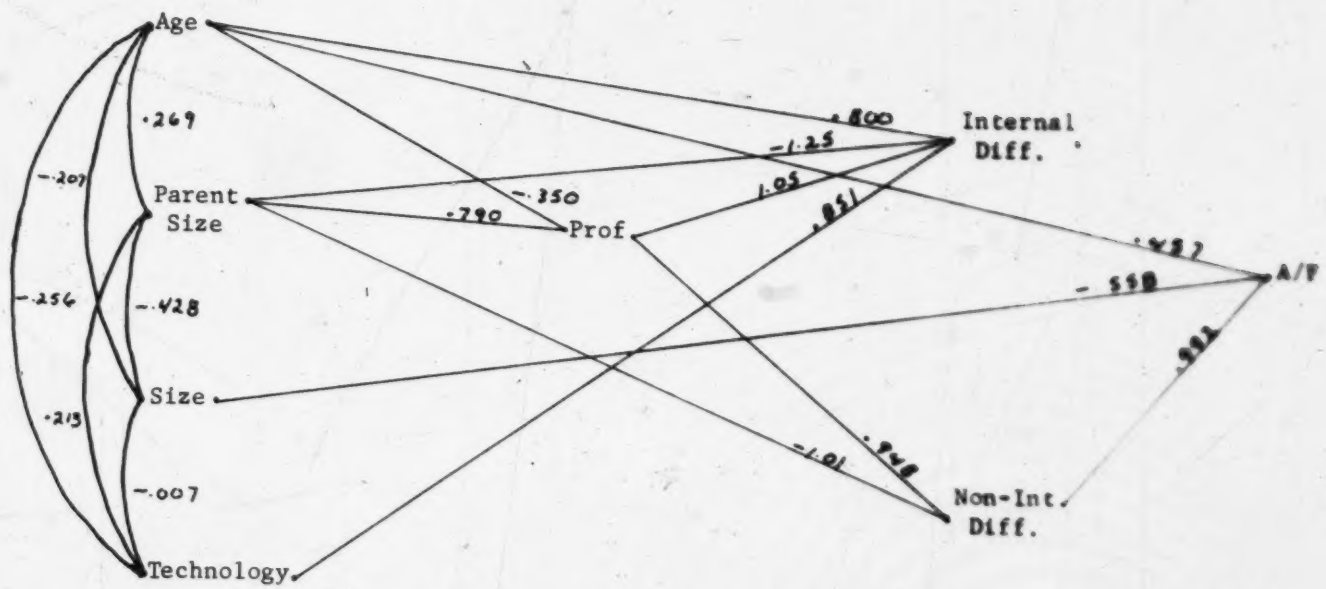
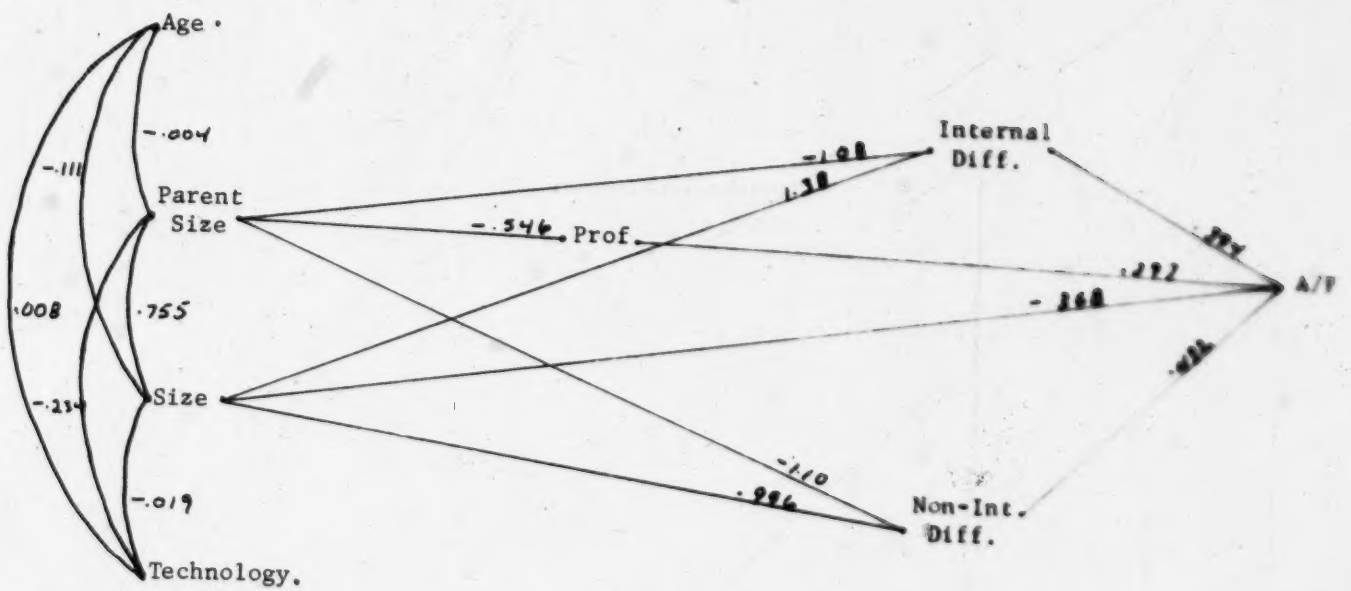


FIGURE 18: <u>Canadian Model</u> (Beta values for intra-school comparisons)



used for comparisons within samples. Tables 14, 15 and 16 give the direct, indirect effects, zero-order correlations, adjusted R^2 and significance levels.

The degree to which the sum of direct and indirect effects approach the zero-order correlations, predicts whether the measurement, sampling and specification errors have been minimized.

Hypothesis 64 is supported for state and Canadian schools. Figure 19 shows the relationships:

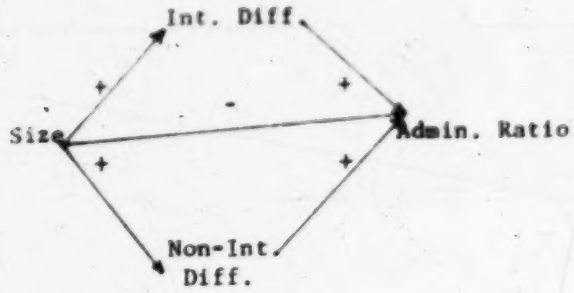


FIGURE 19: The Dual Effect of Size on the Administrative Ratio

That is, for state and Canadian schools (Tables 15 and 16), the negative direct effect of size on administrative ratio is greater than the positive indirect effects of size on administrative ratio. (Zero-order correlations are -.194-state, -.066-Canadian). In the private sample (Table 14), the zero-order correlation (r = .014) is positive. This means that the positive indirect effects of size on administrative ratio (1.31) are greater than the direct negative effects (of size on complexity -1.26). This means that, even though private schools exhibit greater economies of scale when the effect of size is considered per se (i.e., controlling for age, internal differentiation, and non-internal

Explanatory Variables	Dependent Variables	(Beta) Direct Effects	Indirect Effects	Total Corr.	Adj. R^2	Sig. Level
Age	Prof.	-.823	.382	-.446	96.3	.005
Par. Size	Prof.	-.418	-.007	-.424	96.3	.005
Sub. Size	Prof.	N.S.	-.166	-.145	96.3	-
Tech.	Prof.	.800	-.259	.538	96.3	.005
Age	Int. Diff.	N.S.	-.312	-.318	95.0	-
Par. Size	Int. Diff.	-.771	.123	.352	95.0	.005
Sub. Size	Int. Diff.	1.62	-.876	.721	95.0	.005
Tech.	Int. Diff.	.928	-.752	.177	95.0	.05
Profess.	Int. Diff.	-.320	-	.271	95.0	.005
Age	Non-Int. Diff.	1.08	-1.26	-.088	81.1	.005
Par. Size	Non-Int. Diff.	N.S.	.601	.544	81.1	-
Sub. Size	Non-Int. Diff.	1.36	-.687	.618	81.1	.005
Tech.	Non-Int. Diff.	N.S.	.291	.341	81.1	-
Profess.	Non-Int. Diff.	.838	-	.160	81.1	.005
Age	Admin/Fac	-.474	.467	-.010	92.3	.025
Par. Size	Admin/Fac	N.S.	-.032	-.076	92.3	-
Sub. Size	Admin/Fac	-1.26	1.31	.014	92.3	.005
Tech.	Admin/Fac	N.S.	.736	.789	92.3	-
Profess.	Admin/Fac	N.S.	.609	.681	92.3	-
Int. Diff.	Admin/Fac	.579	-	.581	92.3	.025
Non-Int. Diff.	Admin/Fac	.947	-	.674	92.3	.005

TABLE 14. DECOMPOSITION OF PRIVATE SAMPLE ZERO ORDER CORRELATIONS INTO DIRECT AND INDIRECT EFFECTS

Explanatory Variables	Dependent Variables	Direct Effects	Indirect Effects	Total Corr.	Adj. R^2	Sig. Level
Age	Prof.	-.550	.212	-.338	59.1	.05
Par. Size	Prof.	.790	-.148	.642	59.1	.01
Sub. Size	Prof.	N.S.	-.224	-.210	59.1	-
Tech.	Prof.	N.S.	.309	.266	59.1	-
Age	Int. Diff.	.800	-.909	-.107	81.9	.025
Par. Size	Int. Diff.	-1.25	1.07	-.176	81.9	.01
Sub. Size	Int. Diff.	N.S.	.127	.191	81.9	-
Tech.	Int. Diff.	.851	-.145	.660	81.9	.01
Profess.	Int. Diff.	1.05	-	.205	81.9	.005
Age	Non-Int. Diff.	N.S.	-.615	-.581	58.6	-
Par. Size	Non-Int. Diff.	-1.01	.609	-.401	58.6	.01
Sub. Size	Non-Int. Diff.	N.S.	.220	.500	58.6	-
Tech.	Non-Int. Diff.	N.S.	.077	.331	58.6	-
Profess.	Non-Int. Diff.	.948	-	.300	58.6	.01
Age	Admin/Fac	.457	-.495	-.074	65.8	.1
Par. Size	Admin/Fac	N.S.	-.034	.107	65.8	-
Sub. Size	Admin/Fac	-.558	.064	-.194	65.8	.05
Tech.	Admin/Fac	N.S.	-.036	.626	65.8	-
Prof.	Admin/Fac	N.S.	.940	.466	65.8	-
Int. Diff.	Admin/Fac	N.S.	-	.804	65.8	-
Non-Int. Diff.	Admin/Fac	.992	-	.522	65.8	.025

TABLE 15. DECOMPOSITION OF STATE SAMPLE ZERO ORDER CORRELATIONS INTO DIRECT AND INDIRECT EFFECTS.

Explanatory Variables	Dependent Variables	Direct Effects	Indirect Effects	Total Corr.	[illegible]	Sig. Level
Age	Prof.	N.S.	[illegible]	[illegible]	[illegible]	
Par. Size	Prof.	[illegible]		[illegible]	[illegible]	[illegible]
Sub. Size	Prof.	N.S.	[illegible]	[illegible]	[illegible]	
Tech.	Prof.	N.S.	.124	.241	[illegible]	
Age	Int. Diff.	N.S.	[illegible]	[illegible]	74.2	
Par. Size	Int. Diff.	-1.04	1.04	-.051	74.2	.005
Sub. Size	Int. Diff.	[illegible]	-.415	.550	74.2	.005
Tech.	Int. Diff.	N.S.	.227	.450	74.2	-
Profess.	Int. Diff.	N.S.	-	.225	74.2	-
Age	Non-Int. Diff.	N.S.	-.106	.139	39.6	-
Par. Size	Non-Int. Diff.	-1.10	.752	-.347	39.6	.025
Sub. Size	Non-Int. Diff.	.996	-.830	.166	39.6	.05
Tech.	Non-Int. Diff.	N.S.	.238	-.016	39.6	-
Profess.	Non-Int. Diff.	N.S.	-	.263	39.6	-
Age	Admin/Fac	N.S.	-.091	-.104	96.9	-
Par. Size	Admin/Fac	N.S.	-.536	-.644	96.9	-
Sub. Size	Admin/Fac	-.368	.285	-.066	96.9	.01
Tech.	Admin/Fac	N.S.	.248	.386	96.9	-
Prof.	Admin/Fac	.297	-	.677	96.9	.01
Int. Diff.	Admin/Fac	.594	-	.682	96.9	.025
Non-Int. Diff.	Admin/Fac	.432	-	.766	96.9	.005

TABLE 16. DECOMPOSITION OF CANADIAN SAMPLE ZERO ORDER CORRELATIONS INTO DIRECT AND INDIRECT EFFECTS

differentiation), when the total picture is shown, their economies are counteracted by complexity. This tendency is more acute in the private sample. Stated another way, due to size factors alone, private business schools exhibit greater economies of scale than Canadian and state schools. However, because the private sample has greater complexity, the economies of scale are "muted." These findings, as a whole, support the Carnegie Commission (1973) that complexity counteracts economies of scale. Therefore hypothesis 8a is supported.

Path analysis reveals some other interesting results. Notice that direct effects of technology and professional activity are insignificant on administrative ratio (Tables 14 and 15) for private sample. However, notice that the indirect effects of technology (.736) and professional activity (.609) account for the high zero-order correlations (i.e., .789 and .681). However, in the state sample, the indirect effects (-.036, .940) do not accurately account for the zero-order correlations of technology (.626) and professional activity (.466). This indicates that other independent variables, not accounted for in this study, must account for the differences. This could be the case as only 65.8 per cent of the total variation of the variable administrative ratio is accounted for in the state sample.

This completes the section on results. The last chapter will focus on a discussion of the major findings.

CHAPTER III

INTERPRETATION AND CONCLUSIONS

This study revealed some very surprising, interesting and unexpected findings. The most notable and relevant is the strong association (b = .112) of increasing proportion of full professors in administrative specialisms. That is, state universities with larger proportions of full professors contributed to increasing proportions of administrative specialisms such as admissions, placement and alumni. The finding really means that the full professors actually encourage the relinquishment of their power to administrative staffs. This finding contrasted the expected private sample finding of a significant decrease in numbers of administrators when proportions of full professors increased (b = -.179). Bucher's (1970) study, conducted over five years, focused on the power structure of a multi-department professional medical school. She notes the potential source of power which can accrue through expansion of administrative offices:

> Perhaps the <u>greatest</u> potential <u>source of power</u> which the dean has flows from the <u>expansion</u> of the office which he has instituted. . . . The dean has the greatest potentiality of being 'on top' of things, <u>particularly utilizing</u> his expanded administrative offices. . . . It is the business of those in the dean's office to concern themselves with a variety of institutional problems, while others on the faculty concern themselves <u>only</u> with selected problems. (emphasis added)

It should be stressed that of all the criteria of bureaucratization (i.e., using Pugh <u>et al</u>. criteria of bureaucratization, that is, formalization, standardization, specialization and centralization), the one that will be resented most by faculty is the proliferation of

administrative offices, because it represents a loss of control. This reinforced our use of administrative support specialisms as a viable structural measure for measuring bureaucratic conflict.

What the finding implies is a positive orientation on the part of the state business faculty toward the university. Recently some studies have emerged which have found compatibility between professionals and bureaucratic forms of organization. Engel (1970), for example, found that professional physicians in medium bureaucratized institutions felt they had more autonomy than physicians in her samples of "solo" practitioners and highly bureaucratized institutions. She claims that if such bureaucracies can provide funds, facilities and technicians in a stimulating, intellectual climate for interchanging information and controlling quality of performance, that performance should increase. Kornhauser (1966) has also stressed this point, but only in terms of symbiotic need relationships. Thornton (1970) also stresses a concomitant organizational, professional orientation in situations where supervision, evaluation standards and authority patterns are conducted in a "professional" manner. Heydebrand (1973) and Heydebrand and Noell (1973) support such a view. Their studies suggest that conflict in bureaucracies is caused not by inherent bureaucratic/professional incompatibility types of control, but by bureaucratic controls which do not give the professional autonomy. However, the problem with all these studies is that they do not discuss the developmental socialization process by which the professional becomes assimulated into the organization. That is, autonomy and support do not automatically guarantee commitment to the organization. For example, Blau and Scott (1962:71)

and Caplow and Magee (1968) take a "conditional" view on this issue and argue that it is only when advancement within a given profession is limited that the professional will become loyal to the organization. This suggests that if mobility within a given profession is curtailed, that organizational commitment and loyalty will develop, thus reducing commitments to the profession.

Increasing amounts of literature have focused on the socialization process of professionals. A review of the literature reveals that basically three types of variables affect the socialization process of professionals in organizations; personal variables, interpersonal, and structural.

In terms of personal variables, Brown (1969) notes that older faculty are less likely to move. Caplow and Magee (1958) and March and Simon (1958) take this one step further and reason that older employees are less likely to move because they are less attractive to other organizations, hence they develop increased loyalty. Others have focused on the evolution of personal needs of older employees. Levinson (1969) posits that as a person advances in age, his needs may change from self-interest, personal goal concerns to the need for helping others. Hall et al. (1970) support this view. They found that during the first fifteen years that professionals were employed in the forestry service, there was an increased convergence in personal and organizational goals. Moreover, after fifteen years there was a marked decrease in professionalism with a commensurate increase in organization loyalty. However, they qualify this assertion when a person's major source of identification is his profession; then identification

with the profession rather than the organization will continually satisfy his higher level needs.

Other researchers have found that structural variables as related to time are important in accounting for organizational commitments. Corwin (1969) and Grusky (1966) found that as the length of service of an employee increased, so would his commitment to the organization. Becker (1960) theorized and Hrebeniak and Alutto (1972) confirmed that as length of service increased, so does one's intra-organizational investments (e.g., rank) and external investments with resulting increased loyalty to the organization. Sorensen and Sorensen (1974) empirically verified this proposition using rank per se as a measure. However, Hall et al. (1970), who studied forestry employees, and Hrebeniak and Alutto (1972), who studied nurses and teachers, both suggest that their findings may not be applicable to highly professionalized organizations, especially where professional autonomy is required. Stinchcombe (1963), however, offers a viable paridigm for commitment in research orientated universities. His model is applicable to organizations which for success depend on talent which may be scarce. Therefore, he posits if organizational rewards are distributed to a greater degree on one's relative importance to an organization's mission (i.e., less seniority dominated reward system), as compared to the combined criterion of length of service and one's relative importance; then members of the former organization will be more strongly committed to the organization's system that grants those rewards. In research orientated universities, this reward system would be based on professional standards. The preceding review, together with Stinchcombe's model,

suggest a re-examination of the reward structure across private and state samples.

Table 6 reveals some very significant differences across samples. Stinchcombe suggests that the higher the correlation between age and rank (or salary) the more seniority dominated the system; hence greater commitment to the organization rather than to the profession. Table 6 reveals a much stronger association between institution age and rank (i.e., b =-.350) in the state system than the private system(-.294) That is older schools have larger proportions of full professors, while institution size is controlled. Therefore, it cannot be argued that older schools have more proportions of full professors because they are larger. Clearly, it is age per se that accounts for the higher proportions of full professors. In addition, it should be stressed that United States private schools with higher proportions of Ph.D's, to masters and undergraduate students, contributed very significantly (.005 level) to increasing proportions of full professors, while the relationship was insignificant for state schools. This would indicate that in response to graduate education, private schools to a greater degree recruit faculty at the rank of full professor. Accordingly, by Stinchcombe's criterion, the private system is less seniority dominated and, therefore, rewards are based <u>less</u> on the <u>combined</u> criteria of length of service and professional competence. Therefore, the findings confirm Stinchcombe as private schools have less loyalty to the organization as measured by their resistance to a greater degree than their state counterparts, as to the addition of formalized and administrative specialisms (b =-.179).

It should also be noted that the private zero-order correlation

between full professors and support specialisms is +.271. Clearly, the true relationship was obscured. The findings are also consistent with Hodgkinson's (1971) finding that during the period from 1958 to 1968 private faculty loyalty to the institution had decreased by eleven per cent whereas no decrease was reported for his state sample faculty. However, the findings do not explain the socialization process as to why state business schools with higher proportions of full professors develop institutional loyalty and, therefore, actually encourage the creation of administrative specialisms (b = .112). One would have expected tolerance and, therefore, no relationship between proportions of full professors and administrative specialisms, as in the Canadian system. To answer this question one must examine; 1) how the two systems evolved from their original missions, 2) their existing missions and goals, and 3) how the original mission and existing goals, as shaped by state legislatures, have influenced the reward and rank structure of elite state business schools. A fruitful approach for questions 2 and 3 has been proposed by Clark and Wilson (1961) and Georgiou (1973). They suggest that the analysis of the goals and rewards of the power groups should constitute the focal point for analysis. Therefore, in this section, the goals of state legislators, private funding agencies, and both private and state university administrators and faculty will be examined. In response to question 1, Jencks and Reisman (1968), Mayhew (1970) and Ben David (1972) have reasoned that graduate professional education evolved mainly in response to the German model, with heavy endowments from private industrial entrepreneurs. Private schools originally focused on quality research and graduate study. Accordingly,

they recruited top scholarly faculty. Business schools in the state system, however, had to compete with other disciplines for funds, and in the beginning had to stress practical undergraduate curriculum. However, after World War II, the importance of research was fostered by private, federal and state legislative funding agencies. Therefore, the mission of elite state graduate schools after World War II could attract more external federal funds for research and graduate emphasis. Stinchcombe (1965:160-165) stresses the idea that economic and technical conditions (prosperity) cannot influence a systems structural development until appropriate "social devices" are created (i.e., government funding agencies) which can then change an organization's mission. Such changes, then, alter the availability, relative weight and mobilization of strategic resources (i.e., wealth, power and moral commitment). However, due to the relatively greater dependence of state elite business schools on state legislatures still, today, accounts for differences in the two systems (Jencks and Reisman, 1968) as this study has shown.

In response to question 2, viz. the existing state goal structures, some important differences relevant to this discussion (i.e., the positive relationship of increasing proportions of full professors and increasing number of administrative specialisms) include; a) the greater need in the state system for public accountability (Jencks and Reiseman, 1968), b) a greater need in the state system to employ administrative "scientific management" techniques to justify budget increases to state legislatures as a result of the increased competition from increased numbers of two, four-year, and community colleges in the state educational

system (Rourke and Brooks, 1965) c) the perceived significance and congruency of state university administrators and faculty and legislatures to stress the goals of "keeping costs down," "keeping harmony," and emphasis on students. Moreover, state legislators stressed singificantly, negatively the goals of "giving faculty maximum opportunities to pursue their careers," and "protect academic freedom" (Gross and Grambsch, 1968).

On the other hand, Gross and Grambsch found a high congruency between the perceived stressed goals of private funding agencies and private university faculty and administrators, viz. "maintaining prestige," "giving professors maximum opportunity to pursue their careers," "protect academic freedom" and similar congruence on the negative stressed goals of; "keeping costs down," and student emphasis.

In addition, Lazersfeld and Thielens (1958), who support this view, found that trustee and political pressure was much less in their sample of private university faculty. Further, they found that 70 per cent of the administration in private schools would back their faculty on cases on political pressure, as compared to 25 per cent of the administrators in state universities. They attribute the difference to a "pluralistic" system of power in the private system where pressures are apt to come from the independent sources. In contrast, they characterize state schools as having to face "monolithic" pressures. That is, congruency of pressures from legislators, trustees and administrators because the legislators provide the funds.

In summary, the above historical analysis portrays how the original mission and state dependence still acount for salient features of the

state university goal structures. Several of the above goals could account for the nature of the state business school, reward structure and hence account for the strong organizational commitment of state full professors. The administration in state schools are more apt to be evaluated and rewarded on costs and performance related to student centered activities. Since these come into conflict with professional goals, tension is bound to increase, therefore the goal of "keeping harmony" is stressed by both state faculty and administration. Deans in private business schools, however, are more apt to be evaluated and rewarded on faculty research and scholarly contributions, as those are more in line with the goals of the private funding agencies and certainly not inconsistent with the goals of the federal government federal funding agency (Gross and Grambsch, 1968). This suggests increased role conflict for state business school deans, an issue that will be discussed shortly.

The original mission and dependence on state legislatures has also affected the reward and rank structure of full professors. That is, because federal funding did not change the mission of many elite state business schools until after the war, many full professors that currently hold the rank of full professor have obtained that rank through teaching and/or university or community service. Moreover, many are likely to have specialized in the traditionally practical accounting and financial areas. Accordingly, some have probably been involved in budgeting or accounting activities for the institution as a whole. This interpretation of the state business school rank structure is given credence when one examines the findings of Luthans (1967:390). He

surveyed the promotional practices of business faculty in large accredited state business schools with parent sizes in excess of 10,000 students. He found that the promotion criterion from associate to full professor, as rated by the presidents, vice presidents and deans were almost equally split on research and teaching emphasis. That is, deans weighted research highest at 31 per cent and teaching next at 22 per cent, Similarly, vice presidents 36 per cent research, 29 per cent teaching and business schools deans 33 per cent research, 27 per cent teaching. Moreover, he found that one-third of full professor promotions and fifty per cent of associate professor promotions were made with the faculty member having three published papers or less.

This implies that teaching (27) and other criteria such as personality (13), seniority (14), service contributions (12) and competitive bids (6) play a major part in state school promotion. The numbers in brackets represent the average overall ranking of the president, vice president, dean, department heads and faculty on the respective factors.

Other implications can be drawn from the nature of the reward structure. What emerges is that rank in state business schools is tied to a certain length of time in a lower rank. Clearly, the data reveals that state schools do not, to a large degree recruit professors at the full professor rank. The findings show a greater emphasis in the state ranking system regarding the length of service than their private counterparts. Hodgkinson's (1971) data support these findings. In a sample of 392 state colleges and universities and 240 non sectarian private colleges and universities, the presidents of the latter perceived that the average age for tenure over the period of 1958 to 1968 had

dropped by 27 per cent. In contrast the average age for tenure declined twenty per cent in the state sample.

Caplow and Magee (1958) and March and Simon's (1958) theories, as noted, shed further light on the socialization process for organizational commitment. They note that older faculty may have less mobility, therefore increased organizational commitment. Becker (1960) and Hrebiniak and Alutto (1972) suggest that length of service enhances one's internal and external vested interests, hence less desire to leave and increased organizational commitment. This would be especially strong in business schools due to the amount of consulting work that may be involved. Levenson (1961) suggests that increased homogeneity of personnel increases the amount of harmony, thereby creating a less tension prone environment. Therefore, the lack of a significant finding of graduate emphasis and rank again implies a rank structure that is relatively homogeneous; hence greater organizational commitment. Corwin (1969:516), in his sample of 29 public high schools, found that schools characterized by increasing additions to teaching staff within a five year period significantly increased the amount of teacher-administrative conflict (i.e., .47 positive correlation, significant at the .01 level). Finally, Hodgkinson (1971) revealed that between the years 1958 and 1968 presidents of state universities perceived no decline in faculty loyalty to the institution.

In summary, synthesizing the above literature review with the findings reveal that full professor rank structure cadre in state universities is characterized by a cadre with longer lengths of service, and probable increased outside investments, a more homogeneous cadre, and a cadre with substantial proportions receiving their rank based on other criterion than research. Therefore, full professors in state schools

have relatively less (i.e., assuming that research is the new bench mark for rewards, (Ben David, 1972) hence mobility requires successful achievement in publishing) mobility and, therefore, stronger organizational commitment. In these terms, the positive association between full professors and administrative specialisms can be explained. However, the above analysis does not explain the political process a dean may use to gain full professor support so as to permit him to expand his office by adding administrative specialisms. To answer this, we have to focus on the political process at the department level. There are at least two views which should provide insight for future research.

Firstly, Grusky (1959) in correctional institutions, and Grainer (1973) in the British military academy argue that elites controlling rewards by means of legitimate power can command conformity and commitment to the organizations by manipulating the negative sanctions. However, Bucher (1970)in her five year case study of a multi-department medical college, noted that promotions and physical space allocations were based on individual faculty members negotiations with the dean. Moreover, in the negotiations, the normal process was for the dean to go to those above in rank for their "assessed stature" of the candidate. The outcome of the "academic bargain" was usually based on the "assessed stature" which was usually defined as quality of research, the person's thinking ability and personal characteristics. Moreover, she notes that the faculty keeps a close check on the dean so he does not abuse his power. Therefore, Grainer's (1973) analysis seems less likely in institutions where professionals have power.

Bidwell (1965-995) offers a viable approach. He stresses that there are three "modes of authority" inherent in school and university

systems. These bases of authority are derived from the public constituency, legal administrative offices, and collegial faculty subunits. He (1965:1015) claims the effective department administrator in the middle will use both collegial and legal authority. Moreover, departmental administrators will use cooptive strategies to gain faculty support. More specifically, he asserts that administrators will reinforce those aspects of school policy that are congruent with professional expectations. To the extent that the administrator is successful in this "senior colleague role," he can coopt loyalty among the faculty who, in turn, may be more responsive to "requests" which may be demanded by his administrative role. Abrahamson (1966:82-84) sheds more light on this process. He claims that administrators can use two techniques for enhancing loyalty of professionals in organizations. The first is similar to Bidwell's analysis in that he learns which administrative rules can be violated without serious consequences from higher up in the hierarchy. The second is that the administrator will act as a buffer for professionals against negative sanctions from higher in the hierarchy. It is surprising he does not mention the manipulation of sanctions which the administrator also controls (Bucher, 1970).

Given the previous characteristics of the rank structure of state full professors and the greater role conflict of the state dean due to greater pressures from the environment, the results (Table 8) verified that he had a better chance of gaining full professor loyalty through "reciprocal" dealings than deans in the private system. Mayhew (1970:29) stresses this latter point as universities change their mission from teaching to research:

> Then as institutions assumed or were assigned the new mission of becoming comprehensive universities, they appointed research-oriented recent Ph.D's. Thus a bifurcated faculty resulted with a balance of power in the hands of older faculty members seeking to change priorities (i.e., away from research). Several institutions report bloc voting by their two groups for such things as representatives on academic senates, with the resultant power struggle between contending constituencies. Now obviously as the age composition changes as it will toward the end of the 1970's, these tensions will be reduced. But for a time they seem certain to cause at least moderate - and in some institutions serious - administrative difficulties. (emphasis added)

The real theoretical importance of the finding is that it demonstrates that professionals, even in elite professional organizations, can change their orientations. Therefore, type of control has proved to be a valuable variable in conditioning patterns of accommodation in differing university contexts.

In terms of other significant variables, graduate emphasis emerged as having some very relevant implications. If the objective of a business faculty is to enhance its prestige, differentiation, (innovate and support growth) and professionalization, then emphasis on masters and Ph.D training are imperative. Clearly, the large association of graduate emphasis with professionalization (.800-private, .309-state, .128-Canadian), internal administrative support specialisms (.928-private, .851-state, .227-Canadian), and innovative specialisms (.128-private, .227-state, .238-Canadian) provides corroborative evidence of the influence of masters and Ph.D emphasis in business schools. Parsons and Platt (1968) stress the importance of this emphasis for society as a whole:

> The conduct of research and its institutionalization in the graduate schools thus constitute the development of a further platform for the improvement of the academic quality of the entire system, and for its enhanced prestige position in the society as a whole. (emphasis added)

The tables delineating the path coefficients (14, 15, and 16), on the whole, show that the contextual variables operating in universities have many different interacting relationships which tend to confound and obscure correlations.

The general conclusion is that private business schools have more administrative support in terms of greater numbers of administrative support roles and support specialisms, than state and Canadian business schools. The differences were mainly attributed to differing influences in the type of control (i.e., mission) on graduate emphasis, and professionalization. Probably the most surprising finding was that Canadian business schools, in terms of relative administrative support, have more administrative roles than state schools (i.e., controlling for differences in size). Moreover, significant cross cultural variations were noted across state and Canadian systems between the means of variables, including; graduate emphasis, professionalization, and support specialisms. However, as previously stressed, the relative administrative to faculty ratio was greater in the Canadian system. A disturbing finding was the lack of any association between the proportion of full professors and structure in the Canadian schools. This may reflect the later state of development of Canadian business schools in terms of undergraduate curriculum. That is, many of the Canadian business school full professor ranks may be dominated by professors with traditional accounting and finance fields of specialization. With a rapidly expanding Canadian economy, research and graduate emphasis should be stressed to a greater degree in the Canadian business schools. This means a change away from the traditional undergraduate practical

curriculum.

Recent statements that differences between private and state universities are disappearing (i.e., due to the increase in federal funding to the latter) is unsupported by this study. Moreover, Hodgkinson's (1971) conclusion that type of control (private or state) is not an important variable in explaining differences in private and state universities, is also unsupported.

In terms of the size-technology controversy, this study supports the view that in private and Canadian samples, size is a more important predictor of structure (i.e., innovative and support specialisms) than technology. This supports Pugh et al. (1969) and Child's(1973) findings for non educational industries. For state schools, subunit size failed to predict structure except for administrative support ratios. However, technology emerged as salient in predicting internal support specialisms. We reasoned that state schools, due to the nature of their funding, are more bound to the goals of "keeping costs down" (Gross and Grambsch, 1968). Consequently, subunit size may not be large enough to justify the addition of administrative specialisms (Pondy, 1969).

The variable that emerged as an important predictor of structure in private and business schools was the proportion of full professors. These findings support Abrahamson's (1972) findings that rank is based on functional importance. Further, that power accrues to those functional positions is borne out in this study and corroborates the views of Perrow (1970), Hall (1970), and Thompson (1967), Cyert and March (1963), and Child (1972), all who have stressed the importance of the "dominant coalition" idea.

Finally, Clark (1968) stressed the "differentiated" and "combined-process" models in understanding the nature and instituionalization of specialisms. The models were adopted for measures of differentiation in business schools in an effort to measure Blau's (1970) unmeasured concept of "inter-unit heterogeneity" (i.e., the diverse nature of differentiation in organizations hypothesized to contribute to administrative overhead). The greater impact of non-internal innovative growth specialisms (specialisms added via an application of the combined-process model) as compared to internal support specialisms (i.e., specialisms via an application of the differentiated model) on administrative overhead, lends evidence to Blau's theory.

Another significant finding revealed by this study was the importance of graduate emphasis in contributing either directly or indirectly to professionalization, research bureaus, and administrative support. The concepts graduate emphasis (materials technology) and professionalization have never been measured in university studies as variables contributing to structure. Their importance is stressed. Perrow's (1967) concept of materials technology was a successful indicator in this study. Provided the need for graduate training exists, the implications for Canadian business schools are clear. As previously noted, graduate emphasis is an important variable as contributing to professionalization, innovation and quality.

In terms of future research, it would be interesting to see if other university departments exhibited the same structural effects as business schools.

CHAPTER VIII

SUMMARY

A stratified sample of twenty-seven schools of business administration were selected for the purpose of analyzing contextual (i.e., age, subunit size, parent size, materials technology, professionalization, cultural and type of control) influences on selected structural (innovative growth specialisms, internal support specialisms and administrative ratio) variables. The sample of twenty-seven schools of business consisted of nine United States private, nine United States state tax supported, and nine Canadian tax supported institutions.

The basic objective of this thesis was to compare hypothesized contextual and structural relationships across; a) United States private and United States state business schools (i.e., controlling for differences in the type of control and b) United States tax supported and Canadian tax supported business schools (i.e., controlling for cultural differences). Another objective of the thesis was to compare within the samples, the relative strength of selected contextual (i.e., especially size and materials technology) variables as to their respective independent influences on various structural variables.

The findings revealed that United States private elite business schools have significantly larger numbers of innovative specialisms, support specialisms (non clerical) and proportions of administrative roles than state and Canadian elite schools. However, no attempt was made to generalize their findings to the larger populations of private and state business schools; that is, the findings are generalized to high

quality business schools only.

One of the more significant findings was the fact that full professors in United States private elite business schools resist the formation of specialized administrative support specialisms such as admissions, placement and alumni functions. However, full professors in state elite business schools actually foster the development of these specialisms while no association was revealed in the Canadian sample. This finding for the state sample contravenes much of the literature on professionals and their orientations to their professions.

In cultural comparisons, it was found that state tax supported elite business schools have larger numbers of administrative support specialisms. Moreover, it was found that in addition to cultural differences per se; within sample differences in age, raw materials (i.e., proportions of graduate students) and proportions of full professors also accounted for the mean differences of their support specialisms across cultures. However, when the proportion administrative support was computed as a ratio controlling for size, Canadian business schools were revealed to have higher proportions of administrators (non clerical).

In terms of comparisons of the relative magnitude of various contextual variables within samples, the results revealed that subunit and parent size were the best predictors of support and innovative specialisms within all three samples. The predictive power of materials technology was strong, but secondary to size considerations. The major conclusion of the thesis was that the type of external control (i.e., private versus state) and cultural influences (Canadian - United States)

are major forces influencing the direction and scope of elite business school development.

It was concluded that these influences should be systematically included and controlled in future studies of university development.

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APPENDIX A

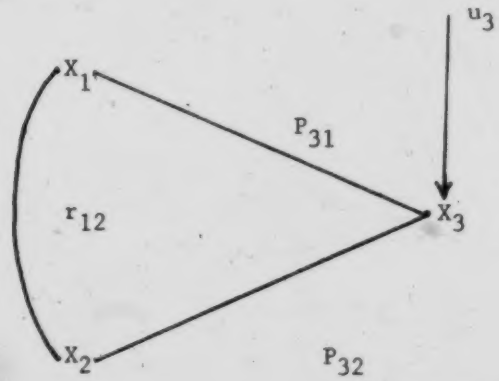
BASIC PRINCIPLES OF PATH ANALYSIS

This excerpt is adopted from Appendix A (alldrich, 1972).

The general restriction on the use of path analysis is that it be used only when working with variables which are assumed to be related in a linear, additive, and asymetric (causal) fashion. In this causal system, at least one variable is treated as linearly dependent upon the other variables in the system. The remaining variables are taken as given, or predetermined. While they may be intercorrelated, these intercorrelations are not analyzed in causal terms, that is, one does not attempt to explain their intercorrelation. It is convenient to label these predetermined variables as exogenous variables and the subset of variables whose dependence is to be explained as endogenous variables. This is done because in causal systems consisting of more than one stage, some of the endogenous variables will be treated as both independent and dependent variables in the equations used to represent the system.

The various dependent variables in the system must be assumed to be completely determined by a linear combination of other variables in the system. The other variables upon which a specific variable is assumed to be dependent can be either endogenous or exogenous; but, as Land points out, ultimately any endogenous variable is dependent on the exogenous variables in the system (Land, 1969:24). In systems where the variation of a particular dependent variable is not totally accounted for by other, prior variables in the system, a residual variable is introduced to account for the remaining unexplained variance. This residual variable is assumed to be uncorrelated with the independent variables which have a direct effect on the dependent variable in question.

The following figure presents a simple three variable system. It should be noted that X_1 and X_2 are exogenous variables, X_3 is an endogenous variable, and u is a residual variable.



AN EXAMPLE OF A CAUSAL MODEL

REPRESENTED BY A PATH DIAGRAM

A path coefficient may be defined as follows: The statement that p_{ij} is a <u>path coefficient</u> means that p_{ij} is a number such that p_{ij} measures the fraction of the standard deviation of the endogenous variable (with the appropriate sign) for which the designated variable is <u>directly</u> responsible in the sense of the fraction which would be found if this factor varies to the same extent as in the observed data while all other variables (including residual variables) are constant (Land, 1968:8-9).

In the notation for path coefficients, the first subscript denotes the dependent variable while the second denotes the independent variable. The squared path coefficient measures the proportion of the variance of the dependent variable which is directly accounted for by the independent variable.

In the examples discussed here, and in most published uses of path analysis, the path coefficients are formally equivalent to the standardized beta coefficients in a regression analysis. This is true for a causal model based on a recursive system of equations, in which there are no unmeasured variables, no endogenous variable is both a cause and effect of any other endogenous variable, and the residuals are uncorrelated. In such a system, the variables are measured in standard form; that is, variables have been standardized by subtracting the mean from each value and then dividing by the standard deviation. As is implied in the above definition of a path coefficient, standardization corrects for differences in scale and variability among the variables in the causal system.

The basic theorem of path analysis, as given by Duncan (1966:5) can be written in the general form:

$$r_{ij} = {}_{q}\, p_{iq}\, r_{jq}$$

The theorem states that the correlation between the ith variable and the jth variable in the causal system (when i is not causally prior to j) is equal to the sum of the products of the paths from the qth variable to the ith variable with the appropriate corresponding correlations between the qth variable and the jth variable. The index of summation q runs over all variables which have a direct influence on the ith variable.

As an example, consider the correlation between X_3 and X_1 in the causal system given in Figure 1: $r_{31} = p_{31} + p_{32}r_{12}$.

If it were the case that X_3 were not completely determined by X_1 and X_2, residual variable, u_3, would have to be introduced into the causal system. A value for the residual path, p_{3u}, can be derived by using the formula for the complete determination of X_j, obtained by setting $i = j$ (Duncan, 1966:6): $r_u = 1 \quad {}_q \; p_{iq} r_{iq}$.

This can be expanded to: $r_u = \underset{q}{p^2_{iq}} + \underset{q,q'}{2} \; p_{iq} r_{qq'} p_{iq}$.

The range of q and q' includes all variables, both measured and unmeasured. In terms of the example:

$$p^2_{3u} = 1 - p^2_{32} - p^2_{31} - 2p_{32} r_{12} p_{31}.$$

In most cases, however, these laborious calculations of the residual path will not be necessary since, as Land has shown, the residual path coefficient "represents the proportion of the standard deviation, and its square represents the proportion of the variance, of the endogenous variable that is caused by all (unmeasured) variables outside of the set under consideration in the path model" (Land, 1969:12). This means that the path coefficient of the residual is equivalent to the coefficient of alienation in conventional regression analysis, or $\sqrt{1 - R^2}$. Thus, in the example, $p_{3u} = \sqrt{1 - R^2}$, where R^2 is the squared multiple correlation coefficient obtained from the multiple correlation of X_3 on X_1 and X_2.

Several conventions are commonly followed in constructing and interpreting path diagrams. Correlations between exogenous variables are shown by curved, double-headed arrows connecting the two variables. Causal relations between variables are shown by single-headed arrows

leading from each determining variable to each variable it is assumed to cause. Residual variables are also shown by single-headed arrows from the residual variable to the dependent variable. They are distinguished from determining variables in this article by labeling them with lower case letters.

APPENDIX B: THESIS DATA

	Age	Parent Size	Subunit Size	Tech-nology	Prof. Activity	Non-Int. Diff.	Internal Diff.	Adminis. Ratio
WHARTON	1881	18222	163	1442	32.5	4	5	10.4
HARVARD	1908	14171	155	2117	49.0	12	17	40.0
COLUMBIA	1916	16580	85	209.1	44.7	5	4	22.3
UNIVERSITY OF CHICAGO	1898	9136	71	208.0	53.5	6	4	33.8
STANFORD	1925	12385	65	211.8	41.5	3	6	27.6
M.I.T.	1925	8024	65	182.3	38.4	1	3	12.3
CORNELL	1946	14642	47	218.9	38.2	6	2	27.6
UNIVERSITY OF ROCHESTER	1958	8438	41	188.5	31.7	3	1	19.5
AMOS. TUCK.	1900	3230	27	200.0	55.5	0	2	25.9

PRIVATE SAMPLE

	Age	Parent Size	Subunit Size	Tech-nology	Prof. Activity	Non-Int. Diff.	Internal Diff.	Admin. Ratio
UNIVERSITY OF MICHIGAN	1924	38328	63	185.1	57.1	4	4	25.3
UNIVERSITY OF KANSAS	1925	19001	40	129.8	27.5	1	2	12.5
UNIVERSITY OF N. CAROLINA	1920	16430	78	120.3	43.5	5	4	15.3
UNIVERSITY OF CALIFORNIA (BERKELEY)	1898	28038	73	213.6	45.2	5	4	16.4
UNIVERSITY OF CALIFORNIA (LOS ANGELES)	1933	30936	80	220.0	35.0	2	4	16.2
PERDUE UNIV.	1958	36888	70	115.7	31.4	0	2	8.5
GEORGIA STATE UNIVERSITY	1913	12197	133	138.2	30.8	5	3	10.5
UNIVERSITY OF MINNESOTA	1919	50415	65	145.1	56.9	2	2	10.7
UNIVERSITY OF COLORADO	1906	28064	75	127.1	42.6	1	1	6.6

STATE SAMPLE

	Age	Parent Size	Subunit Size	Tech-nology	Prof. Activity	Non-Int. Diff.	Internal Diff.	Admin. Ratio
UNIV. OF WESTERN ONTARIO	1932	13368	44	174.6	22.7	0	4	15.9
U.B.C.	1929	21368	54	118.6	25.9	0	2	9.2
UNIVERSITY OF ALBERTA	1956	20593	50	105.4	16.0	0	2	6.0
MCMASTER UNIVERSITY	1952	10093	20	159.8	30.0	0	1	15.0
UNIVERSITY OF SASKATCHEWAN	1943	11456	39	107.2	10.2	2	2	15.3
QUEEN'S UNIVERSITY	1919	7971	32	123.0	40.6	2	4	28.1
UNIVERSITY OF MANITOBA	1937	16671	29	111.2	13.8	0	0	3.4
UNIVERSITY OF WINDSOR	1954	7766	16	110.7	37.5	0	0	12.5
YORK UNIVERSITY	1966	13237	45	144.7	35.6	3	3	24.4

CANADIAN SAMPLE